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NOVEMBER-DECEMBER 1956

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A Christmas Message -- PAGE 252

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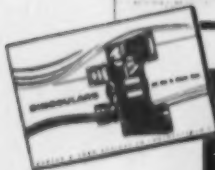
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Audubon magazine

Volume 58, Number 6, Formerly BIRD-LORE

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A bimonthly devoted to the conservation of wildlife, plants, soil, and water

CONTENTS FOR NOVEMBER-DECEMBER 1956

| | |
|--|-----|
| Letters | 242 |
| Bird's-Eye View | 248 |
| by Roger Tory Peterson | |
| Nature's Great Gift | 252 |
| by Alan Devoe | |
| My Conditioned Chickadees | 254 |
| by Louise de Kiriline | |
| Slaughter in Pennsylvania | 256 |
| by Robert McConnell Hatch | |
| Pelican Portraits | 258 |
| by Percy L. DePuy | |
| The Return of the Vanishing Musk Oxen | 262 |
| by Hartley H. T. Jackson | |
| How It Got Its Name—Crawfish | 265 |
| by Webb B. Garrison | |
| The Tree in the Meadow | 266 |
| by Elizabeth Ingles | |
| The Sanderling | 270 |
| by Henry Marion Hall | |
| Dr. George R. Mayfield | 272 |
| by Ben A. Green | |
| The Cattle Egret in North America—1956 | 274 |
| by Alexander Sprunt, Jr. | |
| A Fast Electronic Eye for Bird Photography | 278 |
| by Edwin J. Howard and John C. Marchant | |
| Nature in the News | 283 |
| How to Attract Birds | 284 |
| by Cora Pinkley-Call | |
| The Birds' Christmas Tree | 288 |
| by Gertrude Maier | |
| Book Notes | 292 |
| by Monica de la Salle | |
| Children's Books | 298 |
| by Dorothy E. Shuttlesworth | |
| Index for 1956, Volume 58 | 303 |

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Publications: *Audubon Magazine*, sent to all members; *Audubon Field Notes* (\$3.00 a year), publishes results of bird watching, including seasonal reports and bird censuses; *Nature Program Guide*, *Audubon Junior News* and *Audubon Nature Bulletins* are for teachers and youth leaders.

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Letters

Appeal to Our Readers

Were you a member of the Audubon Junior Clubs in 1910, the first year that the Clubs were organized? If not, do you know of anyone who was a member at that time?

Were you, or do you have a friend, who was a member of an Audubon Junior Club previous to 1935? If you can answer yes to either one, or both, of these questions, please send your name, address, and details to Miss Shirley Miller, Audubon Junior Clubs, 1130 Fifth Avenue, New York 28, N. Y.—The Editor

A Friendly Sparrow Hawk

I would like to tell you about an unexpected guest that came to our house for Sunday dinner recently.

A female sparrow hawk that looked very fierce but actually was quite friendly, sat regally on a trash can in the alley on a Sunday morning and called "kill-ee, kill-ee" with such persistence that we obliged her with a good part of our lamb roast. She snatched a piece and shredded it, and then jumped onto my husband's hand, up his arm, on top of his shoulder, and then—to crown her performance—onto his head.

She stayed the day with us, but safely out of our reach. From time to time she would sound her loud call and we would dash from the refrigerator to the garage and toss a piece of meat on the garage roof. Down she would come to claim it.

After she had eaten her fill, she took a long, refreshing shower in our bathtub, and decided to roost for the night in our bird feeder. Her tail feathers were so long, however, she was forced to sit backwards on the feeder, her face toward the wall, like a child in a corner. It was obviously an uncomfortable position, because she did not remain for breakfast. She left early. Perhaps she did not like to say goodbye!

MARILYN MATLE

Detroit, Michigan

EDITOR'S NOTE: Although Mrs. Matle did not suggest it in her letter, this bird had probably been fed by people before, and might even have been an escaped pet. Its tameness, if it had always been a wild, unfettered bird, was certainly unusual.

Fearless Mourning Doves

In the July-August 1956 issue of *Audubon Magazine*, under "Letters," I

noticed the item about nesting of mourning doves.

For three years, we have had a pair of mourning doves nest here. They have nested four times in a tree over our front walk right next to the front porch. The tree is one of several spruces. They don't seem to mind the traffic—including our four- and five-year-old children, and eat on the ground under a feeder in the backyard. They build their nests on top of old blue jay nests.

During nesting season, the birds are very much in evidence around the yard. In each nest the doves built, they raised two broods.

MRS. DANIEL RODDEN
Metuchen, New Jersey

Strange Accident of a Towhee

While gardening during the afternoon of September 30, I chanced to look up in an easterly direction at approximately 4:00 p.m. As I did so, a bird heading due north out of the next door yard

Turn to next Page

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held my glance. With amazement I watched this bird fly into the telephone line strung along the street. The bird dropped to the ground, beat its wings twice, and expired. Examination revealed the bird to be a male towhee.

As the day was bright, and the sun to the bird's right rear, it hardly seems possible that the bird failed to see the rather large and dark telephone wire.

Should you care to comment, I should be happy to receive your thoughts on this incident.

EDWARD M. BROAD
Manchester, New Hampshire

Mr. Broad's account of the towhee that flew against the heavy wire of a telephone line, strung between two poles, is most interesting. It is also difficult to explain. From his careful description of the circumstances surrounding it, the incident seems extraordinary. One can only assume that the towhee's attention was held with unusual fixity on some other object, or, that the bird may have suddenly gone blind. We know of records of wild birds that have

been gradually or even suddenly stricken with either total or partial blindness, brought on by eye tumors and other afflictions, which presumably accounted for their deaths in flying against windows, the walls of buildings, and other objects. Perhaps this might have accounted for the death of the towhee which Mr. Broad has described.

—The Editor

Remembering "Quito"

The cougar described in your article, "Quito," by Freeman Tilden, May-June 1956 issue of *Audubon Magazine*, had washed my face many times. She belonged to my sister and I'm most anxious to have a copy of that issue for myself and for our school library. I've told the children about this wonderful baby so much that I know they would enjoy the story in *Audubon Magazine*.

MRS. A. C. WATERS

Lutherville, Maryland

Our Big Christmas Issue — 1956

With the November-December 1956 issue of *Audubon Magazine*, we begin a new editorial policy. Henceforth, in any issue wherein we find that our advertising matter is competing for space with our editorial matter, we shall add extra pages to make up, or more than make up, this difference. We want our members and subscribers to get every bit of information, inspiration, and entertainment from the articles and short subjects in each issue that we can offer. We want to point out that it is our increased advertising income that makes it possible for us to produce a bigger, and, we hope, an even better magazine.

—The Editor

Introducing

a new column for the readers of *Audubon Magazine*, beginning with our January-February 1957 issue.

BIRD-FINDING WITH DR. PETTINGILL
Where to go—When to go—What to see



Dr. Olin Sewall Pettingill, Jr., nationally known ornithologist, is the author of the two-volume work, "A Guide to Bird-Finding" (eastern and western United States). His forthcoming column, which will tell of newly-discovered bird-finding areas, both within and outside of the United States, promises to be an exciting and interesting guide for all bird-watchers. Dr. Pettingill is a well-known wildlife photographer and an Audubon Screen Tour lecturer. He also is a member of the Board of Directors of the National Audubon Society.

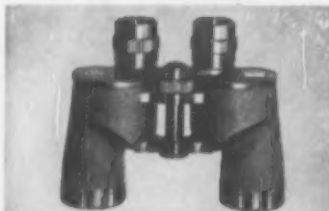
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Is that a woodchuck? Indeed it is, so close he fairly crowds your field of view and you almost recoil from his nearness.

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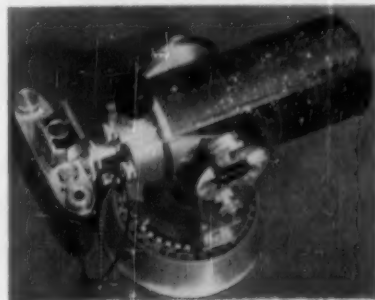
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'scope, no ordinary kind of spyglass, but command the powers and exquisite clarity of a full-size seven-foot astronomical telescope. In fact, the owner of a DeLuxe Questar has indeed an electrically driven observatory, complete to the last circle, clamp and slow motion of observatory instruments. Your Questar's twin is in professional use in great observatories, in schools, universities and research laboratories, as well as branches of the Government. The astronomical use of Questar, and its record-setting sun filter, is a story in itself, which is found in the Questar booklet.

The booklet tells the story of how we could compress the classical instrument into an 8-inch tube by optical folding, and, too, we have a word about high-power photography. Perhaps here we should mention that the cameras shown are ready to have the eyepiece view focussed on their ground-glasses for permanent record, in color if you like, of what you've just seen visually. For Questar's new catadioptric, or mixed lens-mirror optics, have no rainbows of false hue around the image, no "circles of confusion," and the instrument is a superb telephoto lens. Its focal length is 42.4 inches, 1077 mm. at F112.1. With such a lens, of course, it should be easy to photograph the flight of birds across the moon, held rock-steady in the field of view by Questar's motor drive. A lens of such long focus permits the "impossible" picture, with



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What Habitats Mean to Wildlife

Because the residents of some parts of Maine changed their cooking and heating methods, the woodcock, one of the fine gamebirds in the eastern United States, has, according to the U. S. Fish and Wildlife Service, been squeezed out of one part of its normal range. Wild creatures prefer certain habitats, which meet certain general specifications. The woodcock prefers young open growths of mixed hardwood timber, especially near small open fields and pastures.

For years the Moosehorn National Wildlife Refuge in Maine had several thousand acres of good, woodcock habi-

tat of this kind. The normal harvest of firewood on the refuge, by local people, and the clearing of the roads and the tearing out of an occasional patch of brush by refuge personnel, kept that part of the refuge ideal for woodcock. Then came changes in the home-habits of the farmers and the villagers. Oil stoves and furnaces replaced wood for cooking and heating. No longer did the woodcutters automatically keep that unit of the refuge in the partly open condition which the woodcock prefers. Once this wood harvest ended, young trees and underbrush grew up in the open courting areas of the woodcock, and the birds disappeared from several thousand acres of what had formerly been excellent woodcock habitat. To bring back the small park-like areas and with them the woodcock, the U. S. Fish and Wildlife Service is planning a systematic wood-cutting program which should reestablish the habitats necessary for the woodcock to thrive. The trees thus harvested will be used for pulp, fish weirs, fire-place logs, and for Christmas trees.

The story of the woodcock and its lost habitat on Moosehorn Refuge is only one example of its kind. As our economic life changes, it shifts our impact upon the woods and the fields, and so changes the habitats of wildlife, and therefore, the species of wildlife itself. Left undisturbed, nature will often go through a cycle of changing vegetation with each change favoring another kind, or kinds, of wildlife. The open field with its grain and weed seeds may be ideal for the pheasant and the Hungarian partridge, provided a convenient fence row or some other type of cover is nearby. But when the field becomes a brushy area, the pheasant and the Hungarian partridge vanish and quail, rabbits, and other small animals appear. As the brush gradually yields to timber, quail and rabbits give way to the grouse and later to deer and other game. As the woods become thicker, wild turkeys may move in and feed on acorns and other mast that is plentiful. The trees grow taller, the shade gets denser and the underbrush disappears along with most animals except for their occasional journeys through what is now a forest. Finally, with a fire or a timber harvest, the long-shaded ground is again drenched in sunlight which stimulates regrowth of plants and the progressive cycle of plants and animals begins again.

Modifying that cycle to fit the type of game wanted in a given area is one of the jobs of wildlife "management." Just as ducks require marshes so do other animals require certain habitats; when these change, certain species of wildlife may disappear. Hence, if any specific type of wildlife is wanted in any specific area the habitat must be managed to suit the animals' needs.—The Editor

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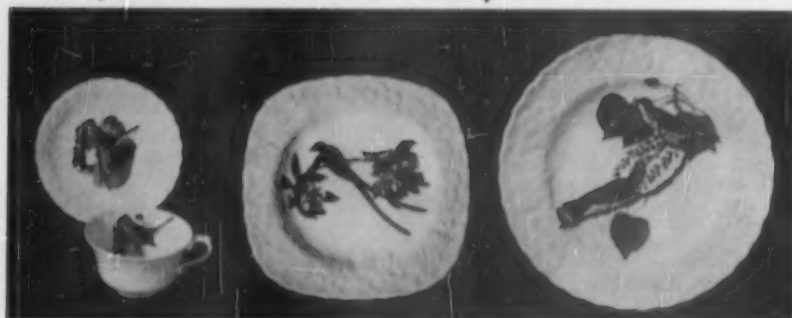
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The Great Natural Experiment

PETER SCOTT, the famous waterfowl painter, dabbed at the canvas on his easel, quickly trying to capture the subtle cloud effects as the sun slowly sank behind polarded willows. We watched him work, and I envied his studio set-up with its huge picture window from which he could watch not only the changing skies but also waterfowl from every continent parading on the surface of the pond. On the far shore a rabbit hopped across a lawn among the grazing geese.

"That poor animal," Peter remarked, "probably won't be alive next week—Myxomatosis. We found our first dead rabbit on the place this morning."

The next day as we drove back to London we came to a stretch where a dozen rabbits had been flattened on the pavement within a hundred yards. Other bunnies hunched stupidly while passing wheels missed them by inches. These unfortunate lagomorphs were blind, afflicted with a virus of the pox group, visibly only under the electronic microscope. An intense swelling and inflammation of the eyelids, spreading to the forehead and the base of the ears was bringing slow, agonizing death. Unable to find their way back to their burrows they would perish in the open.

That was late July in 1954. Two months earlier in the Camargue in southern France I had remarked on the complete absence of rabbits (although we noticed their dried-out pellets in abundance everywhere), and was told that the rabbit sickness had killed them all. I wondered what the local Bonelli's eagles would do, for they depend on rabbits for their main item of diet.

Every biologist and conservationist in Europe was talking about myxomatosis. Meetings were abuzz with conjecture. What was the future of the rabbit? Was the epidemic a catastrophe or a good thing? Opinion was divided.

James Fisher invited me to a nationwide broadcast in the studio of

BBC at Broadcasting House where he was to act as moderator. A panel of three was discussing the pros and cons: "Is myxomatosis good or bad, and should it be deliberately spread to other areas where it is not now known?" One of the men was a farmer, one a humane society agent, the third a biologist. The farmer, having lost a very substantial part of his forage crops to rabbits in years past, thought the disease a godsend. The humane officer dwelt on the agony which the animals suffered and was against any deliberate introduction of the disease into new areas. The biologist insisted that it was too early to assess the end results of the epizootic. One statement on the program interested me very much—that the rabbit was worth at least 30,000,000 pounds (\$84,000,000) yearly to the British economy—through furs, felt for hats, meat for food, and sport, while the damage to agriculture was at least 60,000,000 pounds (\$168,000,000) yearly. I asked James Fisher how those figures were arrived at and he confessed that they were really just pulled out of the hat. The actual damage to agriculture was probably far greater. I could well believe it for I had often seen pastures reduced to rabbit warrens where the exposed sandy soil had eroded away.

Our own cottontail is seldom a pest. Why should the English rabbit have become so much more of a problem? The answer, I believe, is that the Old World rabbit is not a true native of England, or of many areas on the continent for that matter. It was introduced from the Mediterranean countries apparently by medieval monks and other travelers, just as it was more recently transported to many other parts of the world, notably Australia, where it has done incalculable damage. On Laysan Island, in the Hawaiian Group, rabbits introduced for the purpose of establishing a source of meat for shipwrecked sailors destroyed all vegetation and thereby caused the extinction of three endemic species of birds.

Like so many other exotics that

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have taken hold, the rabbits did not have sufficient natural checks in their new environments and soon threw things out of balance. This was aggravated in the British Isles during the last century by the traditional practice of gamekeepers of shooting and trapping weasels, stoats, foxes, hawks, and other predators which helped keep rabbits down.

What was the origin of myxomatosis? It was first reported in 1896 from Montevideo, Uruguay, where a doctor, working experimentally with domesticated European rabbits, had his laboratory stock of animals almost wiped out by a strange new disease. Deciding that it was caused by a filterable virus he called it infectious myxomatosis. Outbreaks were reported among domestic rabbits in Argentina, Brazil, and California. The original source of the disease remained a mystery until a Brazilian in 1942 produced evidence that the disease was endemic in native Brazilian rabbits (and also, presumably, in the other New World rabbits), but that they had developed a sort of immunity, suffering only a benign form of the malady. Our cottontails and jackrabbits are immune.

Practical ecologists toyed with the idea of deliberately introducing this leveler into areas of excessive rabbit population. Lockley, the well-known British ornithologist, actually tried to introduce the disease on his island of Skokholm in 1940 but it did not succeed because the rabbits of Skokholm have no fleas and therefore there was no efficient vector to carry the virus from one rabbit to another. Experiments in Australia on which I will comment later, were much more successful.

In June 1952 a Frenchman inoculated two animals on his rabbit-infested estate. The disease spread like wildfire. Some of his neighbors who saw their rabbit-hunting ruined threatened him with court action. He insisted that he merely wished to get rid of the rabbits on his own place and did not know that the experiment would be so explosive. The epidemic flared into Austria, Germany, Belgium, Italy, Holland, Luxembourg, Switzerland, and Spain. Rabbits died by untold millions. Late the next summer (1953) the epizootic jumped the English Channel, perhaps on the wings of some biting insect (or did some one smuggle some infected fleas?), and soon, with some undercover assistance by farmers, the epidemic reached most counties of England.

Four years have now passed since myxomatosis was introduced into Europe and six years since its "escape" from test sites in Australia. Biologists and ecologists are now able to take stock of the effects. Their analyses are of prime importance to everyone concerned with applied ecology and nature protection, even on this side of the ocean, for they clarify and confirm much of our thinking on what we so vaguely call the "balance of nature." As Dr. Francois Bourliere, the distinguished French biologist points out, "They provide, in fact, an actual experimental demonstration of those 'chain reactions' which Man is in a position to start—sometimes involuntarily—profoundly altering the structure and dynamics of biotic communities."

During the last week in June, this past summer of 1956, conservationists from many countries assembled in Edinburgh, Scotland, to attend the Sixth technical meeting of the International Union for the Protection of Nature. To me, the most interesting sessions of all were the symposia on myxomatosis which lasted for three days. Scientists from England, France, Belgium, Holland, Italy, Germany, and Australia summarized their findings. Here are some of the highlights:

In Australia, grass grows where it had been desert-like. "Nearly miraculous" changes have sometimes completely altered the landscape. Fields that supported only one sheep now feed two cows. During the season of 1952-53 the increase in sheep pro-

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duction exceeded 30,000,000 pounds (\$84,000,000).

In France where rabbits had nipped off the tree seedlings as soon as they appeared, there is good regeneration of the forest for the first time in memory. In the Camargue the first regeneration of the famous and very old Phoenician cedars has been noted. The French Forestry Association has presented a medal to the man who introduced the disease, the same man whom the sportsmen wished to prosecute. The medal portrays a dead rabbit on one side and pine seedlings on the reverse side.

In Belgium the effects have been similar, while in Holland the interesting dune vegetation has altered dramatically, favoring those species of plants which play a great part in dune fixation.

In England in a single year the increase in grass crops alone netted 15,000,000 pounds (\$42,000,000). Forests have shown marked regeneration and many rare flowers, particularly orchids, have become much more common. One species, *Orchis militaris*, considered extinct, has reappeared in two places.

From the point of view of nature protection and also agriculture and silviculture, it seems quite certain that the effects of myxomatosis are, in general, beneficial.

Predators on rabbits, of course, have been affected. Foxes in the Camargue have subsisted mainly at the expense of birds and fishes while elsewhere in France and in England, mice now make up a greater percentage of their diet. The reproduction of both foxes and buzzards seemed to decline; in fact, most pairs of buzzards in the stricken areas of

England did not reproduce in 1955. The buzzards might eventually concentrate on mice as the foxes have.

And what of the future of the rabbit? Will it be wiped out entirely? A sufficient density of wild rabbits is a necessity for a severe epidemic of myxomatosis. In areas of crowded rabbit populations the mortality may be above 99 per cent. Where rabbits live in small scattered groups they may escape infection because fleas, mosquitoes, and other vectors are less likely to make contact. Even though the epidemic may kill 99 per cent of the rabbits in crowded colonies there are always a few survivors. Slowly these build up a population which apparently does not reach the initial level, because of recurrent outbreaks of the disease. The disease itself seems to

Continued on Page 287

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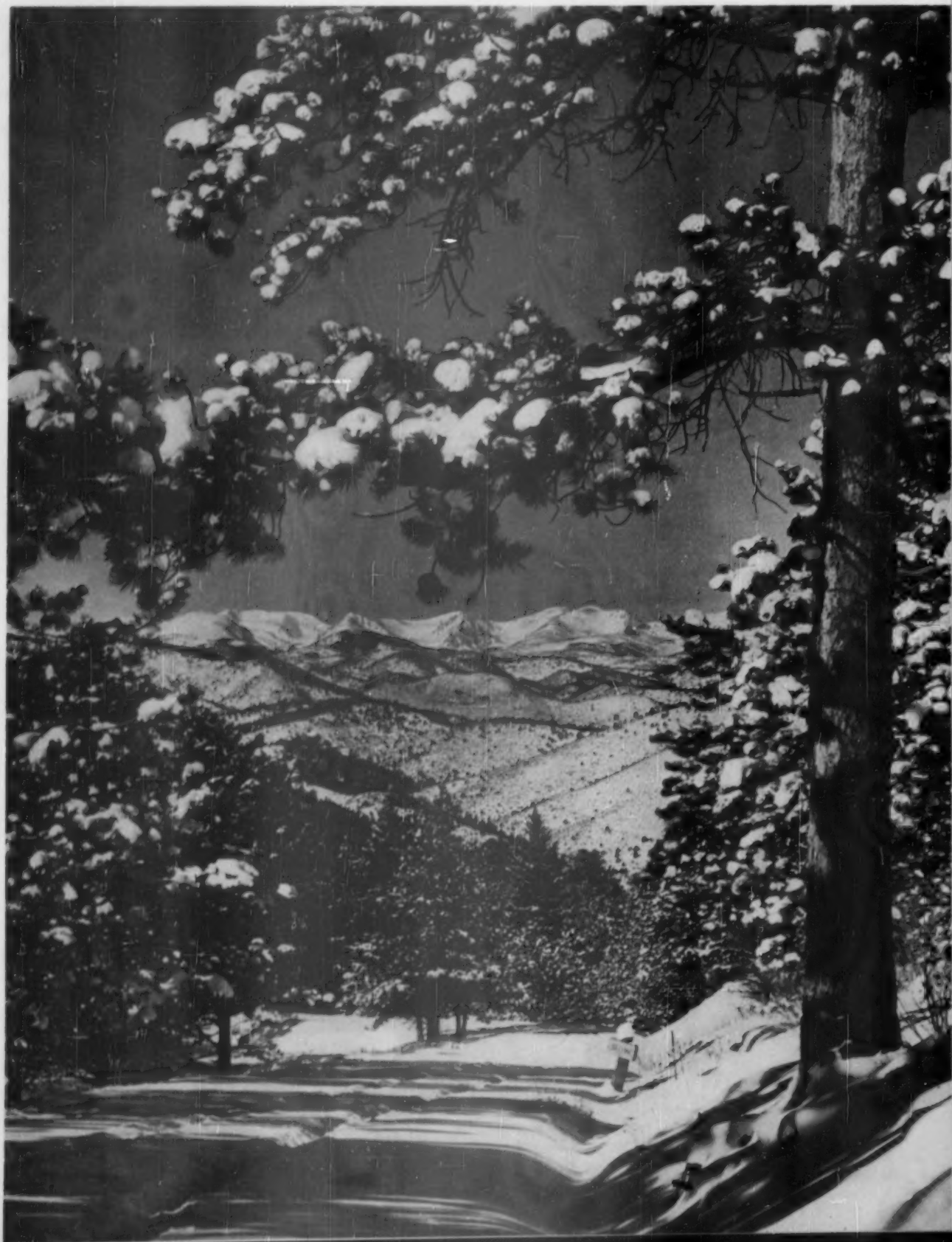
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A Christmas Message to our Readers —

Winter scene photographed by Charles J. Ott.



NATURE'S GREAT GIFT

By Alan Devoe*

THERE is a very old and familiar observation that the best things in life are free. It has been said so long and so often that the words have become, as we say, a platitude. The sentiment is to be winced at for its sound of staleness, not thought about for its enduring meaning. The old words strike our ear as dully, and as unprovocatively of reflection, as all those other dreary and over-familiar iterations about how the water is never missed until the well runs dry, and about how familiarity breeds contempt, and all the rest.

All these tiresome old saws, of course, have one thing in common. It is the fact that they are true. They endure and flourish, to the point of a weary monotony, simply because what they say is a pithy saying of the profound and perennial truths that men discovered back in the dawn-days of the world, and that each new generation of men must in their turn rediscover. They are over-familiar, yes; they are repetitive, yes. So is the rising and setting of the sun; and so is the cycle of the seasons; and so is the nature of the human heart.

The best things in life *are* free. Every naturalist ought constantly to have that realization. But we don't. We forget. Because it is given to us every day to see the sunrise, and every spring and fall to see the wild geese passing, and every hour to have the planetary earth under us and the stretching sky over us . . . because it is given to us to receive so easily and so constantly and with dependable recurrence such things as these . . . we easily get to the point of taking them for granted, and obliviously accepting them, so to speak, as a kind of right. Familiarity does breed contempt. The best

things in life—the incomparable, the stunning grandeurs and excellences of creation—are free; and they are lavished on us with such perpetualness and profusion that we ought to be very nearly stupefied by the splendor. The earth and all that dwell therein, the sky and the stars, and such a “simple fact” as that a seed placed in the soil will burst and burgeon and leap up as the new life called a tree . . . all this tumult of miracle, and our perceptive participation in it, is not ours by any “right.” It is a gift.

The Christmastime of the year is a time when we are much concerned with gifts. We extend our munificence to little nephew George. We render our respectful thanks to Uncle Horace for the handsome paper-cutter. How very pleasant all these presents under the tree! They are impressive gifts, and we are grateful.

Outside our doors and windows there lies a greater gift. There lies the stretching snow, hushed and miraculous. There lie the curving hills, supporting ten thousand mantled evergreens; and in the balsam-scented quiet of those groves the white-tailed deer stand gentle-eyed and drowsing, and the grouse have fluffed their feathers and found security in the drift. There is a gift of music in the air, even in this midwinter season: the small, sweet music of juncos, and the lively fluting of chickadees, and the loud exuberation of jays.

The gift that stretches everywhere out there is compounded of uncountable ingredients. It is a gift that is a million gifts. It is the icy rushing and tinkling of the small brook, and all the implications of that sound: the quenching of the soil's thirsts and our own, the taste in our mouth of a cup of water sweet with the flavoring of earth and air. It is the pattern of leafless trees. It is the pale, dry shining of the winter sun. It is . . . but who can make a catalogue of it? It is the gift of the

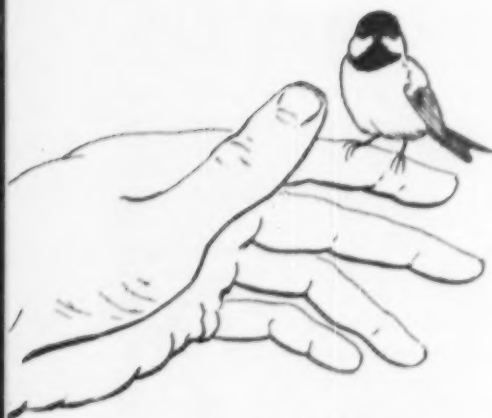
whole singing and shimmering aliveness of the earth. It is the gift of a great harmony and a great peace. (We do not miss the water until the well runs dry. We cannot enough esteem the peace of earth, perhaps, until we have experienced, as lately, the fact of war.) It is the gift, quite simply, of creation.

Whatever else we do at Christmastime, we ought surely to go outdoors. We ought surely to put off from us, in this season, our old dulling sense of familiarity; and we ought to go out and look at our gift. It is only on one day a year that Uncle Horace makes a present to us. The outdoors is a Christmas gift of which we are in receipt every day, every hour, by the mere fact of our conscious aliveness. The Christmas season is but the particular and special commemoration of what Christians take to have been the coming amongst us of the Giver of all this: the Giver of a gift that is recurrent and perpetual through all the year: the Giver, in an act of divine creative kindness, not alone of deer and chickadees and snow and grouse and fir-trees and all the rest, but of our percipient human selves, whereby we might possess and praise.

There may be disagreement among us as to whether the Christian view has the truth of fact or only the truth of poetry. Whichever we feel, it need hardly matter to the spirit of our going outdoors at Christmastime. The gift—whatever the mode and meaning of its giving—is here for our reception. The outdoors is ours; and it is in the nature of a gift that the receiver has a duty on him of gratefulness and of cherishing, proportionate to what is given. We are given the earth, and the woods and waters and sky and all else that makes it. There is an obligation on us of thanks, and a vow to cherishing.

Whatever our faith, there is a perpetual Christmas present to us all. It is made of the best things in life; and they are free. It is an appropriate season, surely, for going outdoors, and, in some place symbolic of our gift—some grove of snow-boughed hemlocks, perhaps, or some mounded streamside, or just some city park where there are squirrels and sparrows—experiencing a sense of thanks for our perpetual Christmas gift, and pledging ourselves to its cherishing. —THE END

* Many of our readers will remember, with deep affection, the writings of the late Alan Devoe. We believe that they will gain inspiration and joy in re-reading, or in reading for the first time, Alan's Christmas message, reprinted here, which first appeared in the November-December 1945 issue of *Audubon Magazine*.—The Editor.



By Louise de Kiriline*

FROM the beginning it was never my intention to tame the black-capped chickadees that came to our feeding-station. In my opinion, taming spoils the true character of the wild creature that is tamed. But when, about 15 years ago, one of the chickadees showed an unusual disregard for my nearness, and indicated a willingness, without a great deal of persuasion, to come to my hand, I decided that this association would be wholly the responsibility of the chickadees.

I never regretted this decision. What the chickadees have since shown me of their elfin character; what they have taught me of their feelings and reactions; all was done in an atmosphere of untrammelled liberty for them. There was only the seed—the magic sunflower seed. The seed pulled away the fear that at first separated them from me. It spanned the bridge of harmonious relationships between us and established the only kind of foundation, I would say, upon which a true appreciation of nature's creatures is built. Whatever compulsion that the seed may have exerted at the start in forging the bond, vanished later, and was of no account.

As I said, there was at first one particular chickadee. This one I called Peet by reason of a special little note he gave as he approached me. Most of the other chickadees also gave this note in the way of an "alert," which had the effect of catching the attention of the other birds as well as of me. But Peet the second, that came into existence a good many years later, was not given his name for the same reason. He

My Conditioned

"What the chickadees taught me was done in an atmosphere of liberty for them. There was only the seed — the magic sunflower seed."

got his because he, of all the chickadees of my closer acquaintance, most resembled the first Peet in character and consequently influenced events in the same way. Both lived in the forest around our house; and being at home is very important in directing the behavior of birds in particular, and of other creatures, too. Both chickadees possessed that innate quality of enterprise that creates pioneers and which, in effect, was the root and origin of the good understanding that came to exist, at times, between the birds and me.

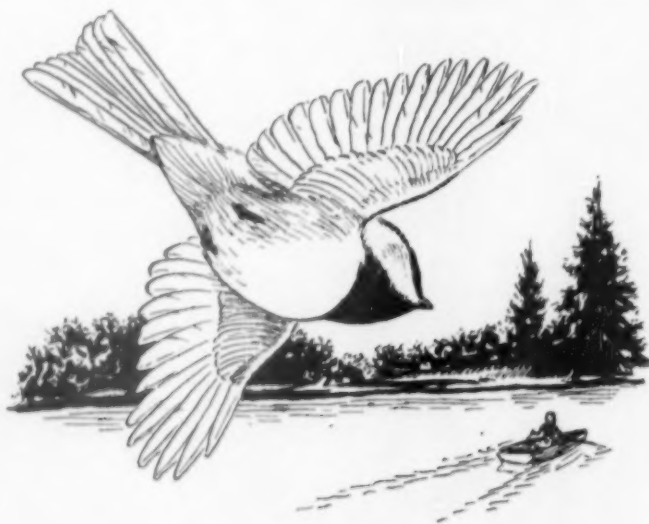
This is how it came about.

Our chickadees had never in their lives, as far as I know, seen a sunflower seed. The first time I put a few of them on their dinner plate, most of them did not recognize the seeds for anything except something strange. But Peet, and that was the first time I distinguished him, pecked at the seed. He took it and turned it around in his bill. This was important. In some way it imparted to him the condition of the kernel. Was it a good seed, a thick seed, a light seed, a poor seed? Whether he could hear it move inside the shell

as he shifted it about, or somehow judged its weight, I never knew. But he and the other chickadees nearly always discarded a bad seed, and sometimes, also, a good one.

Having made the test, he flew to a tree. There he put the seed under both of his feet and held it fast against the branch. This is the way all chickadees and, I believe, all titmice handle a seed. And because they know this, without needing to learn it, it is an instinctive act. He split the seed open by elfin, hammering blows upon it with his bill. When he did not succeed in opening it the first time, he turned it around and tried another spot. It cracked, and he pulled open the shell letting the fragments fall to the ground.

Peet usually ate the kernel, but sometimes he stored it. This happened in times when there was much food available and comparatively few chickadees to share it or, to put it in other words, when the food supply was a little heavy in the environmental balance. Nearly always autumn was the best time to store things away. But there were



* The author lives in a log cabin on Pimisi Bay, in a little-inhabited area of Ontario, Canada.

Chickadees

Illustrations by
Walter Ferguson



other times, too, except the breeding-season, when the chickadees stored their surplus rations.

With great care Peet selected his storing place in the wedge between two twigs, or in a curled piece of bark, or in any convenient fissure where it could be securely tucked in. Often after having deposited the seed, he pulled it out again, flew off with it, searched for another place, found it, and pushed in the seed. *There!* At some time during his countless inspections of every twig of every tree in our woods that he underwent in his great quests for food, he, or somebody else, found the kernel again and ate it.

Now, when I offered Peet a seed in my hands, he took it after only a slight show of hesitation. This gave me to understand that the sunflower seed had rapidly won high favor with him. With increasing assurance, Peet repeated the act again, and then again.

The other chickadees looked on. I knew that they were curious and afraid, interested, and hungry. I knew because some of them lifted the feathers of their black caps, and smoothed them down again. Others opened their bills without uttering a sound, and still others made chewing motions with their bills and

tongue. This chewing had really nothing to do with their eating, or wanting to eat, because they did it, not from anticipation, but from not being able to eat at that particular moment when their timidity overruled their hunger. A few more courageous chickadees became so incited by the sight of Peet plucking so much good food from my hand, that they made dare-devil flights to half-way between their perch and me, then head-over-tails flew back to the perch, often with cries of real or mock fright. Each such attempt brought them a little closer to their goal—the seed—until finally they snatched it and flew off with it with great speed and rejoicing.

This was the way that the two Peets became the "key-birds." Thus, unknowingly, they worked upon the inclinations of their chickadee followers, inducing them to repeat their own successful acts to the advantage of all concerned.

When this stage was reached, the chickadees began to learn things in connection with me and the seed. They found new and convenient ways of seizing the seed, no longer from my open hand only, but from my pockets or from my lips as they alighted blithely on my nose or eyeglasses. At times when the seed and I vanished into the house, some of them clung to the edge of the eave or an icicle and looked in. Some, like suspended marionettes, hovered at the window when they saw me inside. Some followed me from window to window, alighted on the sill, sat, looked in, then pecked at the pane, chagrined that they could not reach me. My immediate response to these charming sights and sounds was, of course, to go out and give them a seed. Gradually, they learned that these activities of theirs usually resulted in the reappearance of me and the seeds. And from then on I had only to move away from the window to have the chickadees fly directly to the door where, sure enough, I appeared and they got their due reward.

By this time the chickadees began to connect me with the seed so closely that the seed and I became, in their eyes, one object. This led me to wonder how exactly did they know me? What in my appearance made them distinguish me with such consistency, that they came volplaning down to me from 60-foot tree-

tops the instant they glimpsed me, that they flew under roofs and inside of houses to find me, and even into my car before I left or at my return from a trip? All of them were by no means so adept at recognizing me. But there were Peet and half a dozen of his followers whose capacities in this respect seemed to have few limits.

In order to find out more about this interesting behavior, I traveled in a boat out on the nearby lake at various distances from the shore. Chickadees are reluctant to cross open spaces, even on land, and they do so willingly only in places that they are used to flying across, or those which they cross in a flock. Even then, a faint-hearted one, when only half-way across, may turn back, or drop down to shrub or tree cover. In spite of this, Peet came to me over the open water, a distance between 150 and 200 feet. Intrepidly, he launched himself upon these flights, sometimes in a good wind that blew his tail sideways, a sweet and touching little figure, alone in mid-air. When he arrived finally at my boat, he pitched on my head or came to the tip of my finger. Having received his seed from me, he made the return trip flying low and direct to the safety of the lake shore. Most of the other chickadees never came any farther away from shore than 25 to 50 feet, becoming prey to all kinds of distractions, such as chasing a companion or pecking at some food. Only a few matched Peet's flights over the water. But beyond these distances from shore, I might as well have been invisible; they appeared not to see me, although with a bird's sharpness of eyesight, it is most unlikely that they could not detect me.

One day I lay down for a nap on the floor under the roof of the porch—a warm and sunny place. If I thought that I would be well hidden from the chickadees I was quickly put to shame. Peet came, perched in my hair, looked for a seed in my hand, and found it. After Peet, several others came and did the same. My noon-hour sleep was ruined, but I really did not mind. It was an interesting discovery to find that the chickadees recognized me, even when I was lying down, and not in my usual upright posture.

After this I did everything I could to keep the chickadees from distinguishing the outlines of my person.

Continued on Page 300

SLAUGHTER IN PENNSYLVANIA

By Robert McConnell Hatch*

Suffragan Bishop Diocese of Connecticut

LATE in October I was hiking with friends along the Appalachian Trail in Pennsylvania. We had spent the morning at the Hawk Mountain Sanctuary, which was established more than 20 years ago to protect birds of prey in their flight southward through Pennsylvania. The sanctuary is visited by thousands of people every fall. While there, we watched a flight of sharp-shinned and red-tailed hawks and were delighted to see three golden eagles. After lunch, in the company of Mr. Maurice Broun, Curator of the Sanctuary, and a few other people, we left for a continuation of our hike.

We drove several miles north of the sanctuary, parked our cars, and followed a well-worn path through scrub oaks to the top of the ridge. We saw the familiar Appalachian Mountain Club trail markers, and we also saw signs posted by the State of Pennsylvania, declaring that accipitrine hawks (goshawks, Cooper's hawks, and sharp-shinned) might be legally killed, but that other species

were protected. Some of these signs were riddled with shot, and I noticed that one had been torn to shreds and scattered over the trail.

It was one of those bright autumn days, crisp and cold, with patches of red and yellow still lingering on the ridges, but it was darkened by the things we saw. We had entered an area, many miles in extent, that was dotted with hunter's blinds in which men hid to shoot hawks and other migrating birds.

Presently we came to a small clearing. The ground was littered with empty shotgun shells. As I looked around I became aware of a great many feathers among the leaves. Then I saw a pile of dead birds. They were sharp-shinned hawks. Some had their wings or legs shot off. All were freshly killed, for animal scavengers had not yet had time to visit the scene.

The Pennsylvania Hawk Committee of 2016 Locust Street, Philadelphia 5, is now at work trying to solve the problem of better hawk protection in Pennsylvania. Anyone interested in helping the Committee should write to Norman J. McDonald at the above address. —THE EDITOR.

We continued our hike. At the base of a tree, which bore one of the state's signs about protected and unprotected hawks, lay the carcass of an osprey, a species which is protected by law in Pennsylvania. Its head had been smashed. As I was examining it, six men approached through the woods. All carried guns. Their leader also carried a small cage containing a live pigeon that they used as a decoy to lure hawks within gunshot range. We asked these men what species of bird the osprey was. Their leader grinned and said that they had no idea but that it did not make the slightest difference to them anyway.

We tossed the dead osprey into the brush and hiked a bit farther. Soon we came upon a blind so cleverly concealed with branches of oak that no migrating bird could possibly detect it. Here we found piles of dead birds. Most of them were sharp-shinned and Cooper's hawks, but there were also red-tailed and red-shouldered hawks, both protected by law in Pennsylvania.

We spread out and searched the woods in front of the blind. Suddenly I came upon a living red-shouldered hawk, shot through the wing. I was about to pick it up when a crippled sharp-shinned hawk fluttered past me. I called to a friend,

* For an account of Bishop Hatch's interests and natural history philosophy, see the note about him in his article, "Broad-winged Hawk—Symbol of the Northern Woods," p. 62, *Audubon Magazine*, March-April, 1956 issue.—The Editor.

who took charge of the red-shouldered, and then I chased after the sharp-shinned. Finally it tired, and I was able to get close enough to throw my coat over it. The bone in its left leg had been severed by a shot.

Carrying the two wounded birds, I traveled farther along the Appalachian Trail. Carcasses were everywhere, mostly sharp-shinned and Cooper's hawks but with plenty of "protected" hawk species sprinkled among them. There was a sickly stench in the air. We had not gone far when we saw something moving beside the trail. It was another cripple—this time a Cooper's hawk with severed leg. Neither this bird nor my sharp-shinned could ever fly again, and the Cooper's died a few hours later. As a kindness, we should have destroyed them at once. Maurice Broun has often had to do that on these bloody ridges, but for some reason we did not. Perhaps we hoped that we could save them. We kept on walking with the crippled birds in our arms, scuffling through the empty shotgun shells that littered the ground at the blinds.

What an experience this was for people who had come to Pennsylvania to enjoy the outdoors, and to admire the beauty of autumn on the ridges! As we concluded our miserable walk the wounded red-shouldered hawk cried out plaintively from time to time. Later we learned that another group of hikers, walking in a different section of the Appalachian Trail, had picked up two immature red-tailed hawks, both badly wounded. Besides the crippled birds that we had found, there were many, many others dying of thirst and hunger back in the woods. Most of the wounded birds do not fall on the trail.

When I reached home I informed the President of the Appalachian Mountain Club about the situation in Pennsylvania, urging that the facts be made known to club members throughout the country. No one who loves the outdoors would care to hike in such an area, and people should be warned accordingly. Anyone who has the slightest feeling for the suffering of other creatures would be sickened by what we had seen.

There is a tragic irony about Hawk Mountain Sanctuary. Here

people come by the thousands from all over the world to watch and admire the migrating hawks and eagles. Here Maurice Broun, the Curator, carries on a valiant fight to teach human beings to appreciate these magnificent birds and to put an end to the shooting of hawks and the sadistic cruelty that he witnesses every autumn. It is a deeply discouraging struggle. All around the sanctuary—to the north and to the south—thousands of birds are slaughtered every autumn—golden eagles, bald eagles, every species of hawk, and many songbirds. The ridges are peppered with blinds like the ones we saw. The woods are full of dead and crippled birds. The carnage is so great that some of the species may already be pushed toward extinction.

Even more shocking than the slaughter of the birds is the spectacle of human beings engaged in such activity. Christianity and all of the great religions teach fair play and kindness. They plead for the rights of men and of the lesser creatures in the wondrous architecture of God's world. Jesus Himself taught that God is concerned for the smallest sparrow, and reverence for life is at the heart of religious faith. Never in this country have I seen such cruelty toward lesser creatures as I saw on these ridges of Pennsylvania.

There is bitter irony in the fact that many of those who destroy our birds of prey excuse their deeds on

Killing of Hawks Continues

"During the past week of September 17 to September 23, 1956, there has been extensive illegal shooting of hawks along the ridges, reported to me by various bird-watchers. Evidence of law-breaking is extremely difficult to obtain.

"Yesterday two bird-watchers witnessed the killing of 25 broadwings, a peregrine and an osprey, at the area Bishop Hatch writes about. Most of the birds dropped out of reach, but the peregrine, osprey, and a few others were taken and rest in my freezer, as evidence for prosecuting the gunners."

MAURICE BROUN, CURATOR
Hawk Mountain Sanctuary
Kempton, Pennsylvania

moralistic grounds. They call hawks "evil" because some of these species of hawks kill other birds. Alexander Sprunt, Jr., in his book, "North American Birds of Prey,"* makes the following observation in his chapter on the Cooper's hawk:—"Man is the greatest killer on earth, not only of those lesser animals over which he has domination, but his fellow man as well. We might recall the statement made by Paul Errington . . . who said that it is 'unfortunate that man, the specialist in evil, sees in predation among wild animals so much evil that isn't there.'"

Scientists who study birds know that the killing of birds and other wild creatures by the so-called "bird hawks"—Cooper's hawks, goshawks, and sharp-shinned hawks—is necessary. Hawks and other predators are one of nature's means of controlling wild animal populations. If the accipitrine hawks did not eliminate a sufficient number of songbirds every year, the death of many songbirds by starvation and disease would result. There is kindness in this—kindness that goes beyond the individual and protects whole families and species. The elimination of part of the songbird population by the accipitrine hawks is just as necessary as the elimination of part of the rodent population accomplished by hawks, owls, and other creatures. There is nothing "good" or "bad" about the natural control of one wild creature by another. This is one of the great fundamental laws that governs nature, and it helps sustain the life of all her species.

Although I am a clergyman, I am no sentimentalist. I number among my close friends men who hunt. I have a high regard for the sport of hunting when it is practiced with due respect for the principles of conservation. However, what I saw that day in Pennsylvania was not sport at all. It was sadistic slaughter. As I left that ridge, carrying with me the crippled sharp-shinned hawk whose left leg dangled piteously on a thread of skin, I kept asking myself:—what can we do to stop this slaughter before these interesting birds, which play so valuable a part in the web of creation, fade from our skies?

—THE END.

* Sponsored by the National Audubon Society and published by Harper and Brothers, New York, N. Y.



"We estimated there were 4,000 white pelicans on the refuge that fall." Photograph by Lewis W. Walker.

PELICAN PORTRAITS

The ethereal beauty of a flock of white pelicans in flight, once seen, is never forgotten. The author describes some of his most interesting experiences with white pelicans on a national wildlife refuge.

By Percy L. DePuy

ONCE, long before I had seen a white pelican in flight, I decided that pelicans were homely; however, I have learned that they have their moments — moments of great beauty. Those are usually the occasions when the birds are seen in flight together in sufficient numbers to give an impression of grandeur. Large flocks of white pelicans stopped at Squaw Creek National Wildlife Refuge in northwestern Missouri during the years I was refuge manager there. This afforded me an opportunity to study these birds.

I saw some of them at their best one morning the first autumn I spent at Squaw Creek. The sun was just edging its way above the Missouri River bluffs behind me as I drove my old pick-up truck down the road from refuge headquarters. In front of me, a blanket of fog hung over



"When a pelican launches itself into the air, it is quite a feat." Photograph by Roger T. Peterson.

lakes, swamps, and woodland. At some points, the fleecy mist was piled into thick clouds, obscuring the landscape. Above other spots, it formed only a thin veil, exposing vistas of mystic beauty.

The sun's slanting rays transformed this scene into a pink and white fairyland. A bit of lake shore about 200 yards ahead of me had a backdrop of tall green cottonwood trees. It seemed to become an enchanted isle where fairies might be expected to dance and play, provided one had the imagination to see them. Then, *presto!* the fairies appeared! Forty or fifty big white pelicans sailed out from behind a screen of fog and majestically flew across the enchanted isle in a single straight line, like dancers crossing a stage.

Sunlight, gleaming through the chiffon-like mist, seemed to cast a pearly aura about each snowy body and its pair of flashing pinions. In less than five seconds, the large birds had passed from sight behind another fog screen but the picture still lingers in my memory. The sun drove the mists away within half an hour, and this 7,000-acre waterfowl sanctuary looked like any other expanse of river floodplain except that it had more than the usual amount of muddy lakes and marshlands.

Later that morning, I saw several fleets of pelicans getting their breakfast. Pelicans have fish for breakfast, fish for lunch, and fish for dinner; if they eat snacks between meals, they have fish then, too. These birds have a system for catching fishes

which is a remarkable example of cooperation—they stage fish-drives.

That morning, they were divided into companies of 100 or 200 birds. Each company formed itself into a long skirmish line with the birds 10 or 15 feet apart. Then they advanced, swimming in a company front, probing the water with their immense bills as they went. This dipping probably netted some fish, but that is not all that it did. It produced a lot of splashing which sounded like a herd of horses fording a stream. The fishes, frightened by this racket, were driven ahead of the skirmish line into shallow water near the shore. There they were largely at the mercy of the birds, and considerable numbers of them must have been scooped up. Those huge bills, and the built-in dipnets (gular pouches), dangling beneath their bills, may not add to the pelican's beauty, but they are mighty useful parts of their natural equipment.

We of the refuge staff estimated that there were 4,000 pelicans on the refuge that fall. They stayed for about a month, and removed at least a ton of fishes from our lakes each day they were present. However, there were so many fishes in the lakes that they needed to be thinned out to give those remaining a chance to grow. Thus, the pelicans rendered the human fishermen a service, although fishermen are not always willing to admit it.

When a pelican launches itself into the air, it is quite a feat. That first old bird I got a good view of while it was taking to the air, was swimming on a barrow pit when I came along and frightened it. First it accelerated its swimming until it was going as fast as it could; then it started flapping its wings to gain additional thrust, gradually lifting its body as it gained momentum. After its body had cleared the surface of the water, its wings took over more of the job of propulsion but its feet and legs continued to assist. For the next 50 or 65 yards, it kicked the water after the manner of a boy propelling a scooter down the street with one foot. The pelican used both feet, bringing them down together, which gave it a rocking-horse motion. Its feet left a trail of dapples four or five yards apart on the water marking its line of

take-off. Finally, after I had begun to wonder if the bird were ever going to make it, or if it would end up by tumbling back into the lake, it lifted into the air.

There were lots of visitors at the refuge that fall. One Saturday morning, a busload of junior high school youngsters with two of their teachers appeared at headquarters seeking permission to tour the refuge area. I accompanied their expedition. Lonely blue herons patiently waited for fishes to swim within striking distance of their spear-like bills, and flotillas of ducks or coots slipped smoothly through the water. These drew interested comments from a few of the youngsters, but they really came to life when we sighted a compact raft of about 200 white pelicans. The birds were riding at anchor about a city block out from shore.

"They look just like a snowdrift floating on the water," remarked one little girl.

Then the bus approached too closely to suit the birds and the whole raft exploded in a pandemonium of frenzied activity as it took flight. The large number of ponderous bodies and the big black-tipped wings beating the air brought the youngsters crowding to the near side of the bus amid a chorus of rapturous "Ohs!" and "Ahs!" It was almost as though a fleet of glistening white yachts under full canvas was sailing out of the lake and upward over a grove of trees.

Our white pelicans have one prize number on their repertoire. It might be called their "grand march"; certainly it is their masterpiece of showmanship. They presented it four or five times during their sojourn at Squaw Creek that fall. The first time I saw the grand march was on a golden afternoon in September when bright sunshine beamed down on almost waveless lakes. Tall sunflowers loaded with yellow blossoms lined the levees along which I drove and dickcissels called from their perches on barbed wire fences.

During the course of my travels that afternoon, I came upon several people fishing from the levees. I stopped to ask one man if he was catching anything. Then I noticed that he had apparently forgotten all about his fishing. He stood intently staring at the sky. Wondering what

he saw that interested him so, I stuck my head out of the cab and stared too. After my eyes had become accustomed to the light and distance, I saw what at first appeared to be a swarm of gnats. Suddenly I realized that they were not insects, but birds a long way up in the air.

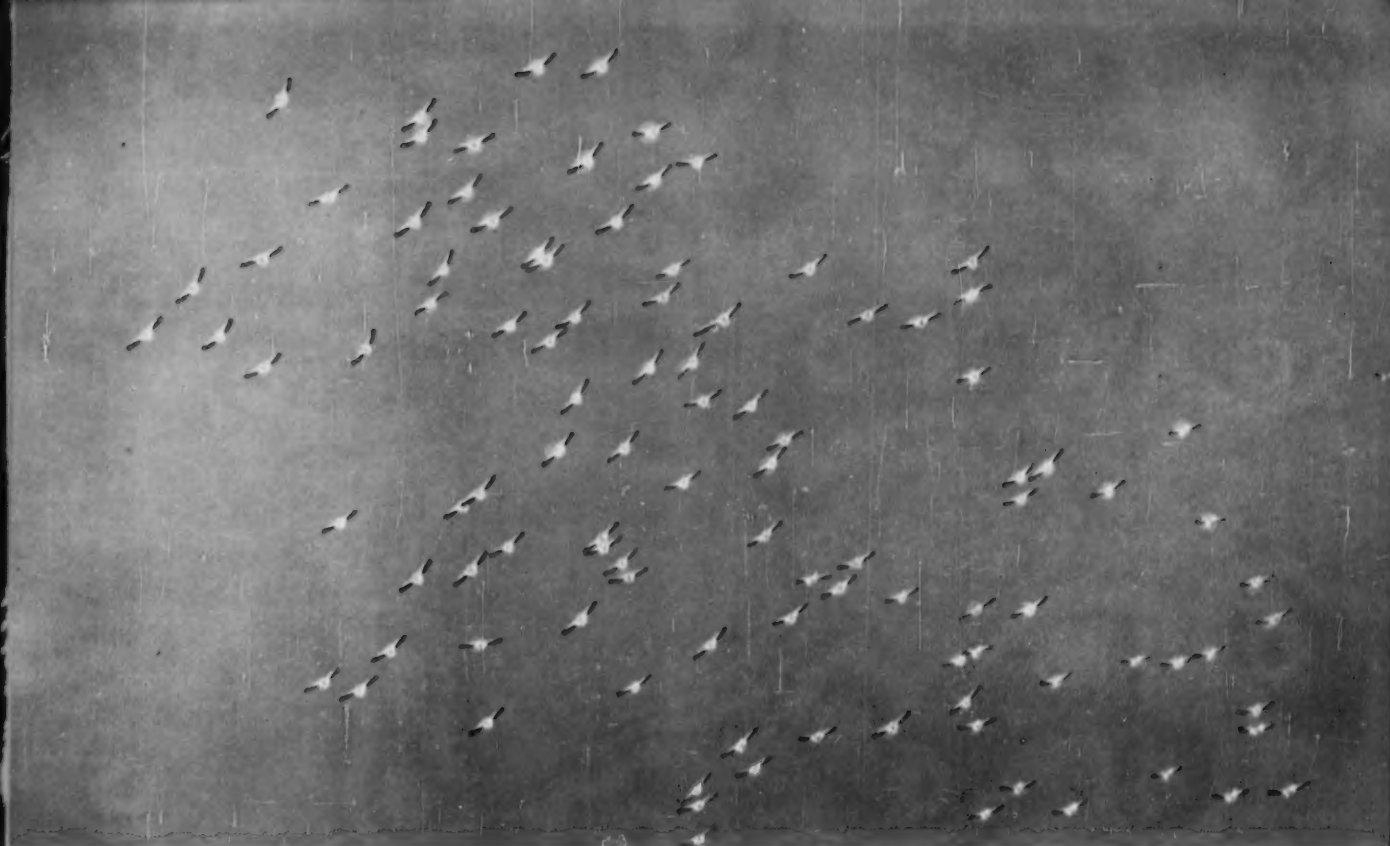
I drew my binoculars out of their case and focused them on the creatures. Silhouetted against the blue dome above were perhaps 500 birds soaring on motionless pinions. Their stubby white bodies, huge bills, and black-tipped wings told me they were white pelicans. Each bird was circling to the right, then circling to the left as though absorbed in playing its part in some solemn ritual. The ceremony was apparently one that required its participants to take themselves far away from earthly interference to a retreat where the air was pure and the perspective wide. Up where they were, they could see dozens of miles of the broad Missouri River and hundreds of square miles of countryside in Nebraska, Kansas, and Missouri.

Below them, the little town of Mound City, Missouri, snuggled against a green hillside. Its inhabitants were going about their daily tasks, most of them unaware that one of nature's finest shows was in progress, perhaps a mile above their heads.

Twice during the next hour, I paused in my patrolling to watch the grand march and to wonder. Like a Milky Way composed of living white stars, the flock hung there, with each individual bird gyrating about a relatively fixed center. The sight gripped me, even though I was viewing it from three miles away.

Each time that I have seen the grand march since that September afternoon, I have wondered about the motive in back of it. What is it that drives these creatures to forsake their homes on the water and hitch a ride on an updraft for an hour or two of seemingly purposeless soaring in the wild blue yonder? Is it a spirit of escapism? Is it a play instinct? Or, is there tucked away somewhere within the pelican's brain, an inherent love of the grand and the dramatic? Whatever their reason, it cast them in the role of the beautiful, and it is one of the most exquisite and wonderful sights in all the out-of-doors.

—THE END.



"Silhouetted against the blue sky, hundreds of white pelicans soared on motionless pinions." Photograph by Allan D. Cruickshank.

"We sighted a compact raft of about 200 birds." Photograph, courtesy Rex Gary Schmidt, U. S. Fish and Wildlife Service.



THE RETURN OF THE VANISHING MUSK OXEN



By Hartley H. T. Jackson

THE musk ox, one of those species which had dwindled in numbers so as to be in danger of extinction, at present lives in the wild only on the northeast coast of Greenland and in arctic barrens directly north and northwest of Hudson Bay as far as about latitude 85 degrees, or within 400 or 500 miles of the North Pole. Even within this range musk oxen live only in certain areas, there being large expanses where none occurs. Although today there are no native wild musk oxen west of the Mackenzie River, there is sufficient evidence, from parts of

skeletons that have been found, and from stories of the Eskimos, that a few of the animals inhabited Alaska as late as about 1850. At that time the species undoubtedly lived over most of arctic North America and northeastern Greenland. Whereas in those days the number of musk oxen in existence probably numbered in the hundreds of thousands, now a high estimate would be 20,000 individuals, most of which live on the arctic islands.

Physical Appearance

The musk ox is an odd-looking, hoofed mammal that resembles a small, shaggy-haired, miniature buf-

falo. It combines certain features of cattle with those of the sheep, but is in no sense a connecting link between them. Stocky in build and short-legged, a large male measures about seven feet long, stands a little over four feet high at the shoulders, and weighs about 550 pounds. The female is smaller. A hump on the shoulders of the animal reminds one of the bison. Its tail is only three or four inches long, its ears are small, and its eyes rather prominent. Its head is broad and heavy; its face wide and short. The male carries thick down-curved horns, the broad flat bases of which nearly meet over the forehead to form a frontal shield.





Illustrations by Walter Ferguson

The horns of the female are smaller.

How It Got Its Name

Although it is not a true ox, the peculiar buffalo-like appearance of the musk ox prompted the name ox, and the prefix musk had its origin in the characteristic musky odor of this animal. The Eskimos call it the *oo-ming-mack*; the Chipewyan Indians, *et-je-ray*. Most species of mammals are known by various names, but "musk ox" is its universal name known to white men, though in olden times it was sometimes called the musk bison or musk buffalo. Even in other languages than our own the term musk ox can be literally translated. For example, in French, the name is *le boeuf musque*.

One might well surmise that any animal adapted to such uninhabited regions as the arctic barrens would be safe from human molestation. To enter the domain of the musk ox, one must take a journey by plane, or by ship amidst arctic ice fields, or else travel by canoe and foot through many miles of Canadian wilderness. Parching winds, cold, and

possibly hunger may greet the hunter. Often, miles of search are necessary to locate a herd of musk oxen, for even in an area known to be inhabited by them they live in small scattered groups that shift their range in following the changing food supply. This gregarious habit, this tendency to gather in herds, is a marked instinct in the musk ox, though the groups are usually small ones of from 10 to 30 or 40 individuals, quite in contrast to the huge herds of bison that formerly contained thousands in a gathering. Search for food may induce musk oxen to wander many miles, but there is no regular seasonal movement, or migration, such as is likely to occur in a species that congregates in immense herds or flocks.

Food Habits.

Grass is the principal food of the musk ox, though it frequently eats willow browse, small flowering plants, and particularly, in summer, the tender shoots of the dwarfed shrubs of its homeland. It is supposed not to like lichens or mosses, but a Mr. Hoare in an old report

for the Canadian Government, says: "The plain on which these musk oxen had been feeding was wind-swept and only about two inches of snow lay on it so the top of the vegetation was plainly visible. It was evident that the musk oxen had been feeding on several varieties of moss and lichens which the barren land caribou commonly use as winter food. . . . On one side of the moss-covered plain was a gentle slope on which bunch grass could be seen sticking up through the snow. Up this slope the musk oxen had evidently passed, without cropping any of the grass, to the mossy ground above. There was also a thick growth of coarse hay a short distance away on the opposite bank of the river. Grass, willow tips, and flowering plants were quite accessible in the district had the musk oxen preferred these sorts of fodder."

In the winter, herbs and all vegetation of the Barren Grounds are often covered with snow. It is then that the powerful hoofs of the musk ox come into play as it paws away the snow to obtain its food. At this season it quenches its thirst by eat-

ing snow, since all fresh water is frozen over.

Aggressiveness of Bulls in Summer

The bulls become rather pugnacious during the summer, and frequent battles ensue between them. Hoare describes a combat which he watched: "About nine o'clock on the night of June 26 I was resting my pack on a big rock about three miles up Hanbury River when I saw three large musk oxen feeding in a hay meadow across the river from where I was. They had not seen me so I quickly got behind the rock and went into camp by getting into my sleeping sack. From there I could watch them comfortably without being seen. After some little time two of the three animals stopped feeding, walked out of the wet meadow to some higher dry ground and be-

gan circling one another with lowered heads, as if for battle. Each then placed its heavy, horn-protected head against that of its opponent and tried to force it back by main strength. After a short while of this, with little success to either side, each animal backed away a few paces and ran with lowered head at the other. They came together with considerable shock. Three times they met, with little advantage to either. Then each backed away until they were about 25 paces apart. In their new positions they stood glaring at each other for a few moments, then, as if at a given signal, each bounded at the other on the same instant, gathering speed as they went, and met with such impact that both were knocked back some distance, one on his haunches. The victor stood in fighting attitude for a short while, then, receiving no further opposition from the vanquished, went and lay down. The other soon followed suit. The third musk ox which seemed to be larger than either of the other two, seemed to pay not the slightest attention to the battle but went on feeding in the meadow."

During the breeding season in August the males are particularly combative, and fight each other for control of the females. They do not breed until four years old. As with some of the other herding mammals, polygamy is the rule, and each successful bull has a harem of about 10 cows. Sometimes two or three bulls with their harems gather together into one herd of 30 animals.

Birth and Growth of Young

The baby musk ox is born in May or early in June, and lies for a while hidden in moss or snow. One calf to a mother every other year seems to be the rule. Blackish brown except for a white patch on its forehead and white feet, it is a curious little fellow covered with fuzzy hair or wool. At birth it weighs only about 16 pounds, but at that it is well developed and within a few hours follows its mother.

When the calf is six months old, little knobs that form on the forehead indicate the beginning of the horns. By the time a male is 15 months old these knobs have grown into straight horns about six inches long that protrude parallel with the ground. As the horns continue to

grow they broaden at the base and bend down and forward in a graceful curve, the ivory-like tips pointing upwards.

Defense Against Wolves and Man

Excepting man, and occasionally a bear, the wolf is the only real threat to the musk ox. The herding instinct, however, is a great protection to the musk ox, and even the wolf is not often successful in its attack on a group. Several wolves in a pack may at times best a single animal that wanders from the gang. An attack on a herd is a different matter, for the musk ox has a method of defense that defies its enemy. At the least suspicion of approaching danger the bulls surround the calves and cows, and, with heads out and lowered, face the wolves in regular battle array. The cows later may join the battle front, and what a front it is! Each head has a heavy bony shield flanked by two sharp horns that with a single upward thrust might disembowel an unwary wolf and leave it prostrate. No wise wolf would approach such a fortress.

Thus, the musk ox is well-adapted to fight its natural enemies of the Barren Grounds. From outside, however, came white men, entirely foreign to the musk ox and its country. Armed with rifles, they had no need to fear that threatening battle formation of horns and shields, for they could kill from a safe distance. Herds of musk oxen were slaughtered without mercy. Now that the species is almost gone, laws and regulations have been passed and reser-

The Musk Oxen

Unique among mammals, the interesting musk ox was known only to the Eskimos and Indians until early in the Eighteenth Century. In 1720, Nicolas Jeremie, a French officer, who from 1697 to 1714 had been in charge of Old Fort Bourbon on the west coast of Hudson Bay, gave to the world the first published notice of the animal. Jeremie described the musk ox rather accurately, and commented on the wool being finer than silk and that it would be worth while to domesticate the animal, but wrote little about its habits. These remained untold until the naturalist and explorer, Samuel Hearne, 75 years later gave us in his "Journey to the Northern Ocean" a detailed and careful account of his experiences with the animal.

In a news release dated September 9, 1956, the U. S. Fish and Wildlife Service reported that the herd of wild musk oxen on the Nunivak Island National Wildlife Refuge in Alaska had increased, from the 31 established there 20 years ago, to 126 animals.

Although the Fish and Wildlife Service has succeeded in re-establishing musk oxen in their ancient habitat, the Service has concluded, after years of study, that it is not practicable to raise them for wool production or other commercial uses. —THE EDITOR.

About the Author

Dr. Hartley H. T. Jackson, an international authority on mammals, retired May 31, 1951 from the U. S. Fish and Wildlife Service after serving as a government biologist for more than 41 years. Dr. Jackson was first appointed as a mammalogist to the U. S. Bureau of Biological Survey, now called the Fish and Wildlife Service, in February, 1910. He has conducted biological surveys, including investigations of birds and mammals, in every state in our country, but has worked most intensively in Arizona, Florida, Maryland, Missouri, Nevada, Oklahoma, Virginia, and Wisconsin.—THE EDITOR.

ventions set aside for its protection. We hope that it is not too late.

Although robust and clumsy in appearance, the musk ox is not slow on foot, and it can run swiftly. It is able to run up steep hills with surprising ease and speed, and could well escape many of the attacks of man if it chose to run away rather than to stand its ground. Eskimos have long hunted musk oxen for food and clothing, but until the use of the rifle against musk oxen, the killing among the herds had never endangered the existence of the species.

First Captive Musk Oxen

The meat of the musk ox is nourishing and tastes like tough beef, but some white men who have eaten it say that it has a peculiar musky taste that they do not relish. The pelt of the musk ox is of very little value to white man, because it is too coarse in hide and hair for him to wear. Eskimos find it valuable for clothing because of its great warmth.

In all the recent attempts to domesticate the musk ox no reference is made to studies on the subject by others; no apparent effort is made to profit by the experience of others in attempting to raise the musk ox, no balance is taken of all known factors, bad as well as good, in measuring procedure. Musk oxen may be seen in a few of the larger American zoological parks, where once they become acclimated they may thrive moderately well. The first captive musk ox in America was exhibited in the New York Zoological Park, where it arrived from arctic America on March 12, 1902. In this same zoological garden the first baby musk ox ever born in captivity arrived September 7, 1925. Others have been kept captive in northern European countries, and the governments of Norway and Iceland have experimented in rearing them without success. The Dominion of Canada through protection of the musk ox in its native environment has increased its population on the Thelon Game Sanctuary, northeast of Great Slave Lake, Northwest Territory, since the establishment of this range in 1927. The only comprehensive study on the musk ox in captivity is that made by the Fish and Wildlife Service in Alaska.

Continued on Page 289

HOW IT

GOT

crawfish

ITS NAME



Illustration by Walter Ferguson

By Webb B. Garrison

GUTTURAL speech of early Germanic groups included the term *krebiz*—approximately equivalent to modern "crab." Passing through Old French and thence into the speech of Britain, the name was modified to *crevisse*. The British people were familiar with only one variety of *crevisse*, a small lobster-like creature that abounded in rivers and brooks. Many a boy probably spent his holidays trying to catch the little crustacean.

The original significance of the

name for "the crab" was forgotten. Changing currents of speech caused folk to look at it in a different fashion. This was especially true in southern England, where "vish" and "visse" were common forms of the word "fish." At least a century before America was discovered, many persons were calling the water-creature the *crayfish*. Still standard in England, the name was again modified in parts of the New World. But like its parent form, the name *crawfish* fails to reveal that the animal is not remotely related to any kind of fish.

—THE END.

THE TREE IN THE MEADOW

A fallen tree
changes life

in a Sierran meadow

By Elizabeth Ingles

THE day began like any other day. Just as the first glow of dawn tinted the eastern sky, the horned owl sent its last muffled message to its mate in the Jeffrey pine up the ridge. Lazily it closed its

round, yellow eyes, and settled down to its daytime sleep on its perch close to the trunk of a tall red fir. Soon the first rays of the sun slanted through the pines and firs surrounding the lovely little Sierran meadow. It was the beginning of a July day which was to alter the lives of many of the creatures that lived there.

A pair of pileolated warblers flashed through the willow thicket in the middle of the meadow. They

were garnering insects to feed the five hungry young ones in the nest among the tall grasses at the base of the young lodgepole pine. From a hidden perch, the coldly calculating gaze of a sharp-shinned hawk followed their erratic flight. Not far away, on the ground, a long-tailed weasel paused to test the air as it jumped through the sedges, the shooting stars, and the tall meadow grass. It was in search of its breakfast.

From the branch of a Jeffrey pine a Steller's jay squawked loudly at a bright-eyed little pine squirrel that mischievously darted at it from around the trunk. A white-footed mouse scampered nervously into its hole in the duff at the base of a red fir, and a dusky shrew hungrily gulped the fat worm it had surprised in the mud at the edge of the tiny brook. A short-tailed meadow mouse hurried along its trail in the thick grass; a montane pocket gopher poked its head cautiously out of its hole in search of a succulent plant. Nearby a golden-mantled ground squirrel and a lodgepole chipmunk chased each other in a dispute over a pine nut.

The rollicking "dee-dee-dee" of the mountain chickadee and the insect-like "tick" notes of the Sierra juncos were not unusual sounds in this Sierran meadow. Nor was the sight of the golden flash of the western tanager in flight above the willows, or the throaty songs of the

To The Reader

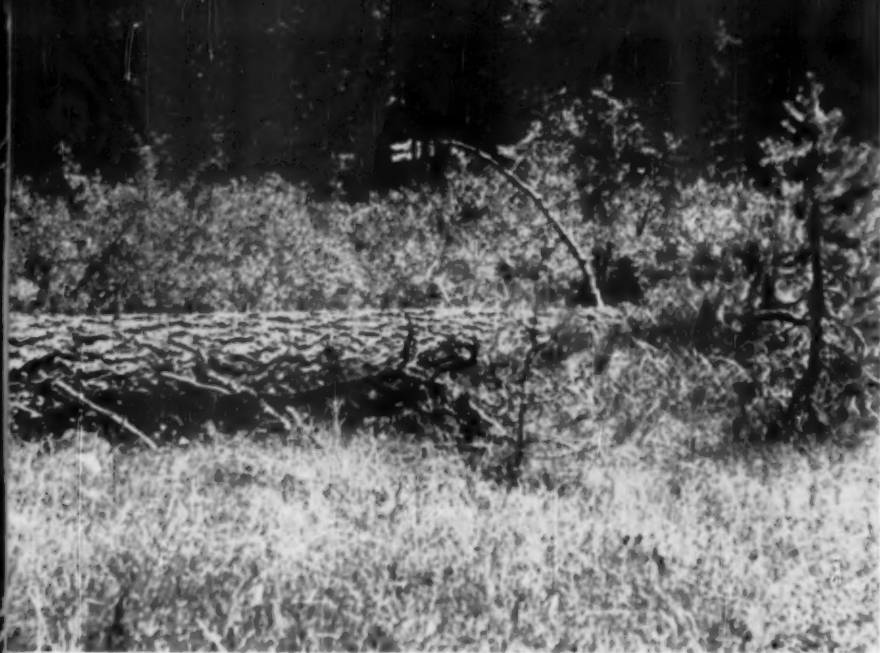
The little Sierran meadow of this article is one of those "gems" of which John Muir wrote. It is small, only about an acre, and it lies close to the cabin where I have spent a part of every summer for the last 10 years. All of the animals mentioned in the article I have seen in the meadow and the incidents recorded have been observed either by me or by my husband, Lloyd Ingles. The pine squirrels, the gophers, the owl, the pileolated warblers, the chipmunk, and the golden-mantled ground squirrel live regularly in the meadow or in the Canadian type forest at its edge. Ten years ago shrews were rare in the meadow, but since the tree fell, as recounted in this article, they have become common. Some of the animals—like the coyote and the

weasel, for example—are less frequent visitors to the meadow, but like the owl and the sharp-shinned hawk, they play a very important role in making this spot an interesting and dynamic animal community.

The article was written to show the changes which even the cutting of a single tree, or, in this case, the natural falling of the white fir, can make in an animal community. Here, because the meadow is small, the ecological impact of the falling tree was greater than it would have been in a larger area. But even in a large meadow, incidents which seem insignificant to an observer, as the falling of a tree, bring about modifications which accumulate over a period of time and result in changes in the plant and animal life.

—THE AUTHOR





All photographs by Lloyd Ingles.

robin unusual here. The distant "yank-yank" call of the red-breasted nuthatch was also a commonplace.

Then—the tree fell in the meadow.

As the slanting rays of the morning sun touched the forest on the west side of the meadow, the long shadow of an aged white fir fell on the ground. The shadow was shorter than it had been on the previous day. Only a gentle breeze stirred the branches of the neighboring trees, but the branches of the white fir creaked and groaned as though they were shaken by some mighty force. The fir itself was in motion. The creaking and groaning noises came from its branches as they dragged slowly through those of its neighbors. The meadow suddenly was quiet. Even the noisy jays and pine squirrels were still. The only sounds were those made by the dying tree as it moved slowly but steadily toward the ground. Suddenly the pull of gravity became so strong that the fir fell with a great rush. As it struck the ground, a loud crash reverberated across the shooting stars, the tiger lilies, the sedges, and the meadow grasses.

The tree had cut a great swath through the willow patch, and had scattered rubble from its broken top and branches to the eastern edge of the meadow itself. The stately white fir, which had lived for nearly 400 years at the edge of the meadow, was down. Its mud-encrusted roots, still

quivering from the shock of the fall, and the gaping hole it left in the earth, disclosed the reason for its destruction, and the shattering of the meadow. As the tree grew, its roots had spread, finally breaking through the wall of an underground spring. The water seeped gradually around the roots of the great tree encroaching more and more until at last the fir, with its "feet" in the water, lacked the support necessary to bear its tremendous weight. The end had come, not only to the dying giant sprawled across the meadow, but also to the community around it, as that community had been. From this moment on, the meadow became a changed place.

The pair of pileolated warblers escaped the first great danger when the tree fell. Now the cries of their ever-hungry young grew more demanding. Hastily, they searched over every willow leaf. But where only a short while before willow trees grew, they now found a great open space. The pair hesitated an instant then flew across the new opening toward the willows on the other side. From its hidden perch, the bright eyes of the sharp-shinned hawk saw the motion below. In an instant, in swift erratic flight, it overtook the brightly-colored male warbler, and sank its talons into its flesh. Then it returned to its perch to eat its meal undisturbed. The other frightened warbler sought safety beneath

a willow leaf, but later, in an attempt to recross the open space to its nest, fell prey, like her mate had, to the vigilant sharp-shinned hawk. The weasel, attracted by the cries of the starving young warblers, tested the air, then gracefully looped through tall meadow grass, straight to the cup-shaped nest at the base of the lodgepole pine. Then, with its hunger appeased, the sleek creature settled down for a nap in a safe spot beside a branch of the fallen fir. Here the pine squirrel, or chickaree, trying out this new "bridge" over what had been a sea of grasses and willows, nearly stumbled over the weasel. With much chattering and excited screaming the squirrel ran along the trunk of the fallen tree. Soon it was exploring among the firs and lodgepoles at the other side of the meadow.

Hungry now, the chickaree descended from the pine tree where it had been resting on a limb. It crossed the ground to a hole at the base of a stump, and scented a cache of the previous year's pine cones. As it prepared to break into the pile of hidden cones, a pine squirrel raced toward it from a nearby tree, ready to defend its property. Furiously, it chased the invading pine squirrel around and around trees, and then hotly pursued it along the trunk of the fallen fir tree back across the meadow to the invader's own forest on the other side.

The weasel was awakened from its nap by the noisy cries of the squirrels. Lazily, it stretched its beautiful body. Then keeping close in the shadow of the fallen fir, it renewed its hunt along the ground for food to take to its hungry young in their nest beneath the roots of a nearby conifer. A short-tailed meadow mouse, a busy little daytime traveler, came running along its grass-covered trail. Suddenly it found its way blocked by the fallen tree. Perplexed for an instant, it hesitated. At that moment the weasel came bounding along in the shadow of the fallen giant. The weasel caught the mouse, and with it in its mouth, left the fallen tree and hurried to its nest.

Evening was now settling over the forest. As the sun went down and dusk came on long shadows, a newcomer entered the meadow. Creeping beneath the topmost branches of the fallen fir, a coyote, with its head thrust forward alertly, paused



"The pine squirrel looked in every direction . . ."



"Termites fell prey to a shrew . . ."



"The porcupine was not afraid . . ."

to rest an instant. As it watched, a tall grass in front of it began to tremble and move downward into the earth. The large animal waited, motionless. Soon another grass followed after the first. Then the curious whiskered face of a montane pocket gopher, with its tiny near-sighted eyes, came out of the hole into which the grasses had disappeared. The coyote charged but the gopher darted back into its burrow. Swiftly, the coyote began to dig in the soft earth, but the gopher, safe in its many-branching underground tunnels, was in no great danger. At last, the coyote tired from its fruitless digging, loped wearily from the meadow, while the jays and the pine squirrels screamed defiantly. The saucy jays followed the coyote, traveling above it from pine to pine. Their raucous voices warned all forest creatures that danger was on the prowl. But the porcupine, noisily dragging its quills along the trunk of the fallen giant, paid no heed, for it was unafraid.

When the tree fell, it brought the end of life to a few creatures, but to others it became the symbol of

a new era of plenty. As the months passed, the tree became the home of many insects. A termite queen hunting for a place to establish a new colony, found the decaying wood ideal for her needs. She settled down to live her life span under the bark. Her colony grew and prospered, and chewed their caverns and tunnels in toward the heart of the great tree. And at dusk, just as the winged members of the termite colony took flight, to establish new colonies elsewhere, the long-eared *Myotis*, common bats of the Sierras, left their daytime perch in a tunnel close by to feed on the insects. As the bats swept the flying termites out of the air, the earth-bound, wingless termites fell easy prey to the voracious appetite of a dusky shrew that lived in the fallen fir. Small beetles, ants, and other insects, and spiders and earthworms became so numerous under the great tree that life became simpler for the ever-hungry shrew. With an endless food supply at hand, this little animal prospered and raised brood after brood. Before the tree had fallen, dusky shrews were not common in the meadow, but as

"A lodgepole chipmunk got into a dispute . . ."



"A doe hid her fawn near the fallen tree . . ."





"A red-breasted nuthatch called . . ."



"The long-tailed weasel awakened . . ."

the seasons passed, and the tree sank deeper and deeper into the soft meadow earth, shrews became more and more abundant.

Beside the tree, the grass grew taller and the willows bent over the trunk. Here in this shelter, a mule deer doe hid her fawn while she browsed near. The gaping hole from which the tree wrenched its roots as it fell dried, and earth tumbled into the opening. Above the opening, the great roots stretched out like the arms of a giant octopus. Here one spring a Townsend's solitaire, a newcomer to this Sierran meadow, built her nest in the earth which still clung tenaciously to the sprawling roots. With an ample insect supply close by in the rotting log, the bird had no difficulty in raising its five young. Early each morning, and again as dusk fell, the wonderful melodious song of this bird filled the meadow.

Although the first pair of pileolated warblers were not able to cope with the sudden change that the falling tree had made in their environment, other pileolated warblers soon filled the niche that was left

vacant. Each spring, after the tree fell, several pairs of warblers flitted nervously about in search of insects in the willow thickets. As life and luck go, some were successful in raising their broods, others fell to the predators of the forest. But without the jays, the weasels, and the sharp-shinned hawks, the meadow would have been a duller place. Other montane pocket gophers and short-tailed meadow mice took the places of their ancestors that had either been eaten by predators or had died of old age. The pine squirrels conducted regular raids, on others of their kind, across the fallen tree "bridge," and occasionally a coyote or a pine marten came hunting there and brought excitement to the quiet meadow. But after the great tragedies and abrupt changes of that first summer, when the giant fell, life in the meadow became adjusted and formed a kind of balance.

Nothing is quite the same as before, however. In the summer the haunting melodious voice of the Townsend's solitaire occasionally sounds across the meadow, and the



"The horned owl settled on its daytime perch . . ."

Continued on Page 297

"A pocket gopher peered out of its burrow . . ."



"A meadow mouse came to the fallen tree . . ."





Illustrations by Walter Ferguson.

By Henry Marion Hall*

The Sanderling

THE flight of shorebirds on a rising tide shows a wild ecstasy capable of carrying them considerable distances before the impulse fades and hunger makes them pause. Our coastal distances mean little to their long pinions—a hundred-mile flight from the mouth of the Kennebec River in Maine to Highland Light in Massachusetts—what do such short travels mean to migrants

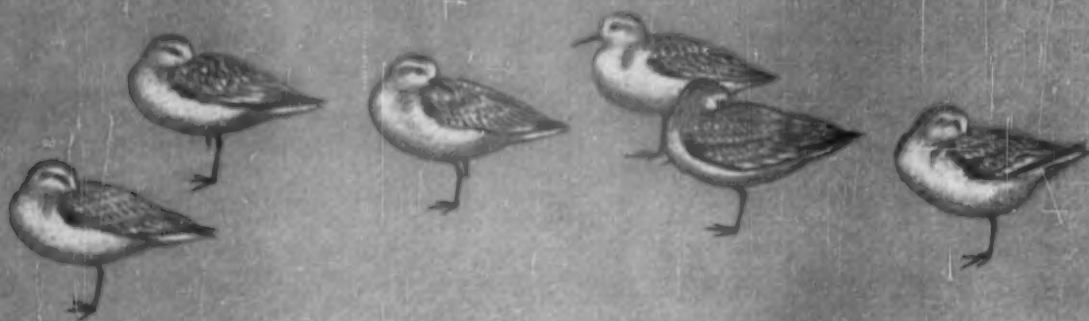
which annually flit from Baffin Bay to the Argentine and return?

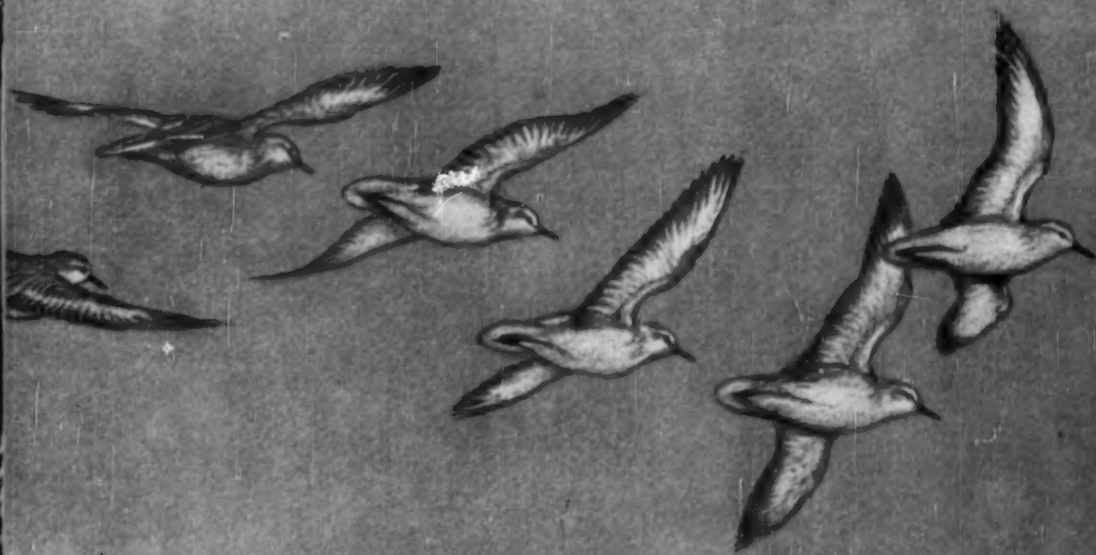
Taking off from some northern coastal beach, many of them have barely struck their stride when they sight the tip of old Cape Cod, flung like a sickle in the sea. Whether they will stop or not depends largely on the tides. They seem to follow the air trails as long as the water is rising, particularly when driven by storms. The very instant when the ebbing water bares flats and bars, the migrants arrive like magic, as if they

had timed their voyage accordingly. Before the sea has receded a foot, I frequently hear their voices high overhead, and presently a few yellow-legs or plover drop down out of nowhere. They whirl alongshore for a few minutes, as if looking for a place to land, and throng the flats as the lowering tide uncovers them.

It is the same story all the way from the St. Lawrence River in Canada to Plymouth, Massachusetts, and thence round the Cape to Chatham and Monomoy. Every-

*Dr. Hall, author of previous articles in *Audubon Magazine*, is now at work on a forthcoming book, "American Shorebirds." Many of our readers will remember his previous books, "The Ruffed Grouse," and "Woodcock Ways." Dr. Hall is president of the Audubon Society of Rhode Island.
—The Editor





where the emerging land crooks a beckoning finger to the shorebirds, the green of the meadows tolls them in, and a sandy universe is a playground for their twinkling feet.

Just as the outside beaches give the best glimpses of migrating shorebirds, so the inshore flats and lagoons are the most convenient places to observe their feeding habits. The sands of Barnstable, Wellfleet, Monomoy, Martha's Vineyard, Montauk, and dozens of other harbors and promontories on the Atlantic coast, are visited by innumerable sandpipers, snipe, and plover from the arrival of the first ring-necked plover early in July to the dis-

appearance of the last sanderling in mid-October or later.

Almost any day between these dates, I can watch many different species without stirring from my

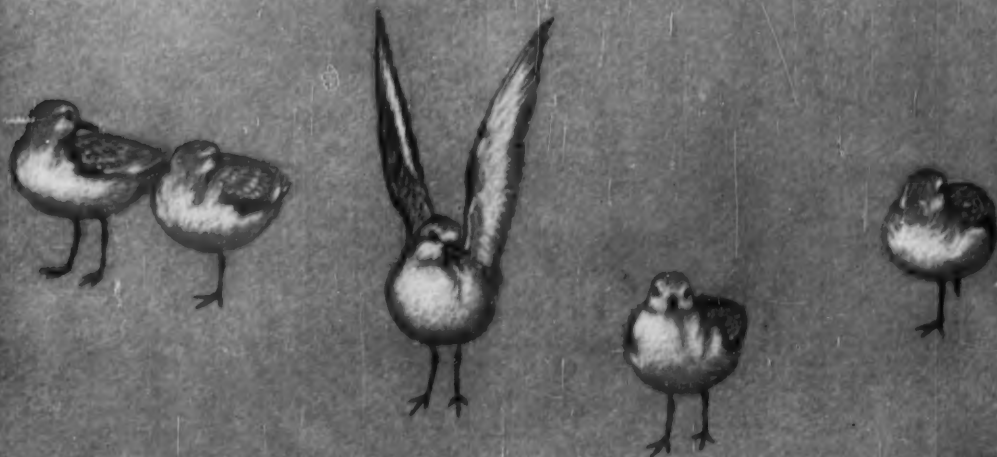
Provincetown, Massachusetts, wharf. When the tide ebbs, flurries of shorebirds arrive everywhere and alight, elevating their wings and peeping complacently. They start feeding

Continued on Page 296

THE COSMOPOLITE

According to the "Check-list of North American Birds," 1931 edition, the sanderling, *Crocethia alba*, breeds on the Arctic Islands, Southampton, and northern Greenland; also in Iceland, Spitzbergen, and northern Siberia. It winters along ocean and gulf beaches from central California, Texas, Virginia, and Bermuda to Patagonia in

South America. It occurs "casually," or occasionally in winter, in Massachusetts, and British Columbia (Vancouver Island); in the Eastern Hemisphere, from the Mediterranean, Burma, and Japan, to South Africa and various Pacific Islands. In summer, sanderlings that may not breed sometimes linger along the coasts of Florida and on certain Pacific islands.—
The Editor



Dr. George R. Mayfield

By Ben A. Green

A ROBIN's alarm cry that meant "cat!" to Dr. George R. Mayfield, once interrupted a college faculty dinner that was being held in Dr. Mayfield's honor. He is the 79-year-old former chairman of the Tennessee State Conservation Commission, and thought by his associates to be an unequaled authority on bird calls. Dr. Mayfield readily recognizes in the field the calls of more than 300 species of birds, and he knows and can interpret 20 distinct notes of the robin. On some 3,600 dated cards he has listed his personal bird observations over a period of more than 40 years.

Until nine years ago, Dr. Mayfield was a full-time college professor and head of the Department of German. He was chosen Vanderbilt University's "friendliest professor and best-dressed man on the campus" in 1947, the year he retired from classroom duties.

"He became intensely interested in birds much by accident," said Mrs. Mayfield in a recent radio interview devoted to discussion of her husband's career as one of Tennessee's finest ornithologists.

The "accident" was the result of an appendicitis operation in 1905, when Dr. Mayfield was a graduate student and instructor at Vanderbilt. It took many weeks for him to recover from septicemia that set in to make him "all but lifeless." On the branches of trees just outside the open window of the upstairs room in which he was convalescing, he saw many birds and found comfort and interest in them. Lying there, listening, with hardly enough energy to breathe, the young college instructor had fallen in love with the birds that brought life back to him.

When he was strong enough to walk, he roamed the outdoors, watching the birds and listening to them. Four months of this made him a well man, and gave him a hobby that he believes is still adding years to his life. This inspiring convalescence set the pattern for much of the rest of Dr. Mayfield's life; a career which



Photograph of Dr. George R. Mayfield as he reads a scientific paper on his studies of mockingbirds.

is still making a lasting impression on the conservation history of Tennessee.

Knowing birds in the field, says Dr. Mayfield, is entirely different from studying them in the museum and learning about their habits from other persons. He points out that some of the world's outstanding authorities on birds, especially in Europe, have confined their work to museum research, and would be all but lost in the outdoors.

In Tennessee Dr. Mayfield has identified 37 kinds of the many different warbler species known to nest in the United States. The warbler family has given Tennessee unusual distinction in bird history. There is a "Tennessee warbler" and a "Nashville warbler," both named by the famous pioneer ornithologist Alex-

ander Wilson, during a visit to Tennessee in 1810. His naming of these birds made Tennessee the only state in which both the commonwealth and its capital city are honored by bird names.

Dr. Mayfield's energetic bird study led him into an analysis of mockingbird imitations, recorded mainly on the Vanderbilt campus and at his summer home, "Birds-I-View," located on the Stone's River about 12 miles south of Nashville. These records cover a period of several years. In one 20-minute period he listened to a single mockingbird imitate the calls and songs of 30 different species of birds. In his summary of 5,211 calls and songs of mockingbirds heard during several years, he noted their imitations of 59 other species of birds.

In his studies of mockingbird mimicry, he has divided the birds imitated into four classes:

(1) Most frequently imitated — Carolina wren 12 per cent of all calls; blue jay eight per cent; cardinal six per cent; titmouse five per cent;—a total of 31 per cent were of these four species, among all birds imitated.

(2) Those frequently imitated — wood thrush, flicker, bluebird, crested flycatcher, purple martin, towhee, red-headed woodpecker, red-eyed vireo, and Maryland yellow-throat—these nine species were nine per cent of those imitated by the mockingbird.

(3) Less frequently imitated—22 species ranging from the white-eyed vireo (95 times) to the bronze grackle (10 times).

(4) Rarely imitated—24 other species.

Dr. Mayfield's analysis showed 45 per cent of all imitations were of permanent resident or year-round birds; summer resident birds were represented by 55 per cent; winter resident visitors only one-ninth of one per cent among imitations. This, he believes, is because birds sing less frequently in the winter season.

Dr. Mayfield's wonderfully acute hearing and excellent eyesight (he wears glasses) are not much impaired by the passage of time. At 79 he sees and hears the birds almost as well as he did 40 years ago, and he thinks he understands what they are saying a lot better. He can still walk seven or eight miles in a morning with little show of fatigue. More than six feet tall, and slender, he takes a long stride when he walks.

By listening to thousands of robins, Dr. Mayfield found the bird has a "cat" alarm call sounded as "*Chuck . . . Chuck . . . Chuck*" in clock-beat rhythm. This is different from "the general alarm" call made with a loud chirp. These two calls, Dr. Mayfield found, were markedly different from 18 other "mood calls" of robins that tell whether the bird is happy, lonely, excited, hungry, flocking, satisfied, anxious for its young, courting, headed for a roost, or otherwise disposed. An ability to see and hear birds can be developed by almost anyone willing to give the time and energy required, Dr. Mayfield be-

lieves. An associate once wrote of him:

"Where birds are concerned, he has a keen eye and trained ear, and can accurately name a bird which is apparently not there so far as the untrained observer is concerned. This faculty has been developed by spending his leisure hours for many years with birds in the open country."

In 10 trips to Europe Dr. Mayfield has sought to make definite comparisons between birds of the United States and those of the Continent. He found many similar species, but there are far fewer species in "Old Europe" than in the "Young United States." During World War I, Dr. Mayfield spent two years with the French Army in welfare and educational work. In the first year he identified 60 different species of birds in the vicinity of one army camp. He speaks French and German fluently, and reads other modern languages. He is also a Latin and Greek scholar and taught these subjects for years before specializing in German.

Some of his most valued library volumes have been "picked up" in Europe. There in 1918 for \$14.00 in American money he bought a highly prized collection of "European bird plates" in color by Naumann. Very few sets of these splendid plates have made their way to America. Most are in museums and libraries.

Dr. Mayfield has twice served as chairman of the State Conservation Department of Tennessee. He was chairman in 1939-43 under Governor Prentice Cooper, and secretary during the administration of Governor James McCord, 1945-48. He was again appointed to the State Conservation Commission in 1953 by Governor Frank G. Clement, and he was chosen chairman by associate commissioners.

Dr. Mayfield was born in Chinquapin Grove, Georgia, near Lawrenceville, March 21, 1877. A typical farm boy, in his early years he fished much, hunted, and did farm chores. At age 14 he went to Atlanta to attend night school; during the day he worked as a jewelry store clerk. After graduating from the Atlanta High School he became a school principal at the age of 20, and later taught at Emory University where he was graduated. In 1903 he came

to Vanderbilt as a graduate student, and remained for 43 years as a faculty member—his service interrupted only by his wartime activity overseas.

Dr. Mayfield received his Ph.D. from Vanderbilt in 1915. He is reputed to know more than 5,000 Vanderbilt alumni by name and "could spend five years visiting in homes on invitations from alumni." He long served as chairman of the faculty lecture series committee and was a leader in numerous other campus activities.

During his first 15 years at Vanderbilt, Dr. Mayfield was regarded as a "highly eligible bachelor" but in 1920 he married Miss Lillie Hasslock, who has not only been his wife, but his closest associate in bird study for 36 years. They have one son, Lieutenant George Mayfield, who served two years in the U.S. Army, part of the time in Japan. He is now a medical student at Vanderbilt. The Mayfields live at 2414 Vanderbilt Place, Nashville.

Founder and editor of the *Tennessee Academy of Science Journal*, Dr. Mayfield was also founder of the Tennessee Ornithological Society, a founder of the Nashville Children's Museum, and for many years has been a member of the American Association for the Advancement of Science, the Wilson Ornithological Club, the Chattanooga Audubon Society, the Georgia Ornithological Society, and other ornithological groups.

Dr. Mayfield has observed birds throughout Tennessee, and has visited in all 48 of the United States; including a trip to California for a study of the California condor on the Coast Range. He also has explored in the Rocky Mountains, the Great Smokies, the Appalachians, and the White Mountains, and has helped North Carolina mountaineers catch rattlesnakes for their hides. More than once he has been forced to explain hurriedly his innocent mission when, armed with field-glasses, he has ventured too closely to mountain hide-outs where rugged individualists were "moonshining."

For some years Dr. Mayfield has contributed a weekly column "*Fins, Furs & Feathers*," to the *Nashville Banner*, a daily newspaper. He has long advocated conservation to increase birdlife.

THE END.

The astonishing establishment of the African cattle egret in America and its rapid spread over the eastern United States is one of the remarkable ornithological events of our times. A well-known ornithologist of the National Audubon Society brings us his latest account of

THE CATTLE

By Alexander Sprunt, Jr.

THOSE familiar with the distribution of the cattle egret, *Bubulcus ibis*, in North America up to 1955, entertained considerable expectation of the further spread and establishment of it in 1956. The results more than justified such expectation and even exceeded it, well deserving the term "explosive." That this species has become a well established breeding bird in southern and southeastern United States is now an accomplished fact, and the discovery of additional localities as nesting sites is only a matter of time. Indeed, one wonders how many more now exist, or did exist during 1956 than those described in this article.

In brief retrospect, it will be recalled that I outlined all that was known, or all I could gather about the African cattle egret* and the history of its invasion of the West Indies, Central America, and this country. My present account brings information up to date for 1956, at least to the beginning of the fall season. In so doing it has been thought best to treat the additional information by regions and states, and to end this report with a summary.

West Indies. Some clarification is now possible regarding the original appearance of the cattle egret in the Virgin Islands. In my paper for 1955 (*Bulletin of the Massachusetts Audubon Society*, February, 1956) I stated on page 67 that data on this subject had been mislaid. The lost material has since been found and is important in that it establishes a first record not until now published.

What was thought to be the first record for the Virgin Islands was published in the *Wilson Bulletin*, December 1955, by Mr. George A. Seaman, of St. Croix. In a letter to me dated August 1, 1956, Mr. Seaman says—"In the *Wilson Bulletin* for December 1955, I have described the first appearance of the cattle egret in the Virgin Islands. This was a flock of 26 birds observed at Sprat Hall, St. Croix, on February 21, 1955." Actually, the species had appeared prior to this date as contained in the "mislaid" but since recovered data mentioned. On December 29, 1954, two cattle egrets were seen at the east end of St. Croix, at an elevation of 400-450 feet, in guinea grass, feeding with cattle, by Mr. Herbert Mills of Philadelphia, a gentleman of experience and accuracy. His observation, therefore, should stand as the first record for the Virgin Islands.

The cattle egret may have become a breeding species in these islands in 1956. Again quoting from Mr. Seaman's letter: "May 29, 1956 . . . Several cattle egrets were observed today on the 'mangrove island' among little blue herons and snowy egrets . . . I strongly feel that at least one pair of young belonged to the cattle

egrets . . . These birds exhibited much nervousness and became quite excited as we approached. They made a peculiar guttural noise . . . and when we rowed away settled immediately back in the bushes."

In Cuba the cattle egret continues to increase. In addition to the first and second records for that island that I noted in *The Bulletin of the Massachusetts Audubon Society* (in the provinces of Habana and Camaguey) the cattle egret was recorded from near Santiago, Oriente Province, January 27, 1956 by Mr. and Mrs. George Lamb. They obtained excellent color slides of the egrets, which I have seen. As yet, no nesting of them has been discovered.

Florida. At the beginning of 1956, I was at Okeechobee, conducting the fourteenth season of the Audubon Wildlife Tours based there. I remained there through April and on every one of the scheduled trips, I was able to show cattle egrets to visitors in numbers varying from a dozen to as many as 75 birds at a time. The Audubon Tours based on West Palm Beach and Fort Lauderdale saw cattle egrets in even greater numbers. This was, of course, to be expected since the Okeechobee region is the "source locality" for the bird in this country and the hub from which it has radiated.

As the nesting season approached for cattle egrets in 1956 at Lake Okeechobee, it became evident that excessive drought and an unprecedented lowness of the waters in the interior of the lake were having a detrimental effect on the usual species of herons and ibises that breed on the islands there. On April 30, Bayard W. Read and I made a preliminary investigation of the site of the great rookery of 1955, an island off the south shore of the lake, where some 600 nests of cattle egrets were counted that season. Though this trip was accomplished by outdoor motor skiff it was necessary to wade in for some distance through water only a couple of inches deep and then to hike over stretches of dry ground to the willows covering the island. A somewhat hurried survey revealed that cattle egrets and eastern glossy ibises were building nests, and laying eggs, with every prospect of the rookery increasing.

Notification of what we had found was sent to Samuel A. Grimes and Herbert L. Stoddard, who participated in the 1955 survey. On May 26, 1956, both of them, with Bayard Read, Hall Tennis of the Florida Audubon Society, State Warden J. W. Scott, Audubon Warden Glen Chandler, and myself, assembled at Pahokee, Florida. For the next two days we made a thorough check of the rookery, on the island in Lake Okeechobee, and counted the astonishing number of 1,080 cattle egret nests! Very few native herons were breeding there but the glossy ibises were present to some 2,000 pairs.

This survey was only possible by the use of air-boats as, by this time, the lake level had sunk to a hitherto unknown low of 10.91 feet and it shrunk to 10.03 feet in July. No outboard motor craft could come anywhere near the rookery. One of the air-boats was that of the National Audubon Society, piloted by Warden

* See Smithsonian Report for 1954, Washington: 1955, pp. 259-276, and the *Bulletin of the Massachusetts Audubon Society*, Vol. XL, February, 1956, pp. 65-69. For other discussions of the cattle egret in North and in South America and in Africa, see *Audubon Magazine*, July-August 1953; September-October 1953; March-April 1954; and September-October 1956 issues.—The Editor.

EGRET IN NORTH AMERICA — 1956



Chandler, the other was furnished by the Game and Fish Commission of Florida and piloted by State Warden Scott. Further investigation later, by aerial patrol on the part of Bayard Read and State Warden Conrad, disclosed that, in the whole vast expanse of Lake Okeechobee, only one other area harbored any breeding herons and ibises. This was an island off the north shore of Lake Okeechobee where about 25 to 30 pairs of cattle egrets were nesting.

Thus the nesting population of cattle egrets on Lake Okeechobee in 1956 consisted of some 1,100 nests, and averaged three young to a nest brought to maturity, or to the flying stage. This is a seasonal population of 3,300 young, and 2,200 adults, or 5,500 birds. So much for the "source locality," or big rookery of cattle egrets in Florida.

Published records hitherto for cattle egrets nesting in Florida have embraced only one other locality (Gainesville). But in April 1955, on a small island in the St. John's River near Melbourne, Allan and Helen Cruick-

shank saw four cattle egrets alight on nests and feed their young.

Herbert L. Stoddard wrote me that on June 29, 1955, on a small island in the Gulf of Mexico off Panacea, Florida, he with Mr. Harry Beadle "noted five young just able to fly of what I considered to be cattle egrets. I ran one of the weakest down and had Harry take colored movies of the then very yellow beaks that had attracted our attention. But as we saw no adults in some three hours . . . I kept the observation 'under my hat' to check on it this year." If Herbert Stoddard "considered" them to be young cattle egrets, they *were* cattle egrets! Further, another check was made this season of 1956 at the same island and a nest of a cattle egret was discovered, with eggs. This is the *first salt-water breeding* of the cattle egret in this country, or rather the five young of 1955 was the first, with the nest and eggs of 1956 another record in the same spot.

Georgia. Curiously enough, this state continues to show few records for the cattle egret in 1956. It occurs there

sparingly and probably nested this spring of 1956 but no breeding record is known for the state. Herbert L. Stoddard's observation of a single bird on the Altamaha River, July 27, 1954, plus one other observation, remain the only records for Georgia. During June and July, 1956, "about eight birds" were found feeding with other egrets near cattle, on Sapelo Island, Georgia, by Dr. John Teal et al.

South Carolina. The first record for the cattle egret in South Carolina has hitherto been accredited to Messrs. Peter Gething and James F. Cooper who saw a single bird at Litchfield Plantation, Georgetown County, August 8, 1954 ("Woods and Waters" column, *Charleston News and Courier*, August 11, 1954, quoted in *Audubon Field Notes*, October, 1954, p. 339). A recent communication from Beaufort County throws new light on the cattle egret's original appearance in this state and antedates the hitherto supposed first record. In a letter to me dated June 30, 1956, Mrs. Alva D. Hines of Hilton Head Island states: "we have seen the cattle egret for the past two years on Hilton Head." Mrs. Hines' statement records the cattle egret in South Carolina on July 8, 1954 and precedes the Gething-Cooper record by one month. She is a very careful observer and her observation should stand as the original record. There are now records from Charleston, Colleton, and Beaufort Counties, which are all coastal.

The first breeding of the cattle egret in South Carolina was discovered in 1956, and all things considered, it was in a most unlikely location! On July 4, Messrs. Ellison A. Williams and Philip Staats of Charleston, visited a heron rookery on Drum Island, a patch of marshland and bushes in upper Charleston Harbor, crossed by the Cooper River Bridge (U.S. Highway 17). This rookery has been occupied for several years and usually has in it, snowy egrets, little blue, Louisiana, and black-crowned night herons, with occasionally, some American egrets and white ibises. The reason for the visit of Mr. Williams and Mr. Staats was the reported nesting there of eastern glossy ibises, something of an ornithological sensation in itself. The site of this rookery is almost within a stone's throw of the Charleston waterfront wharves and docks. Not only were glossy ibises found by Messrs. Williams and Staats, but there were two pairs of cattle egrets also! On July 9, from a blind, they saw these cattle egrets feed young in the nests. This, of course, is a salt-water locality. No nesting record of this species as yet, is anywhere so near a metropolitan area. Within a five-mile-wide circle of the nests on Drum Island live some 150,000 people. An account of this discovery appeared in "Woods and Waters" of the *Charleston News and Courier*, July 12, 1956.

North Carolina. This state, hitherto showing few records for the cattle egret, came very much into the picture in 1956. In *The Chat* (official organ of the Carolina Bird Club), Vol. 20, June 1956, p. 38, appears this statement: "The first cattle egret to be recorded from North Carolina has been taken (collected) in Bladen County, near Kelly, N. C., on April 29, by David Adams. Details to follow."

While it is true that the above mentioned cattle egret was the first to be collected in North Carolina, as scientific proof of its occurrence there, it was *not* the first observed in the state. On April 20, 1956, Mrs. Raymond

E. Jackson of Chatham, Mass., driving north from Florida, saw a single cattle egret near the roadside between Wilson and Elizabeth City, N. C., and so advised me by letter. Her record, therefore, is the first for the state. On June 16, with my wife and a cousin, Lawrence G. Sprunt of Wilmington, N. C., I visited a heron rookery at the mouth of the Cape Fear River opposite Southport. We made the trip to establish whether or not the eastern glossy ibis was nesting there, as had been reported. They were, and we also discovered two pairs of cattle egrets nesting. The two nests held young birds. Completely unknown to us at the time, was the fact that, the day before, on June 15, these nests had been found by Messrs. T. L. Quay of North Carolina State College, at Raleigh, and a graduate student of his, David Adams of Southport, Adams having collected the specimen of the cattle egret already mentioned. Later, on the same day that we found the nests, we got in touch with Adams in Southport and found that he and Quay had been ahead of us! At the time we thought this to be the first nesting outside Florida and the first in a salt-water location. Here, then, in North Carolina, the cattle egret had appeared for the first time, was collected, and nested—all within a period of two months.

Virginia. Little has transpired as yet on the status of the species in this state. I published the first record in the 1954 Smithsonian Report, p. 267, that of two birds seen at Chincoteague, May 13, 1953 by Buckalew. On May 19, 1954, E. O. Mellinger, then Refuge Manager at Chincoteague, saw one cattle egret, and on May 2, F. R. Scott of Richmond, saw two there. By September of that year the cattle egrets had increased to ten. Jack Perkins, Manager of the Back Bay Refuge, writes me: "We have only one record here . . . April 29, 1956." (This was the same day the North Carolina specimen was collected.)

Mr. Perkins was under the impression that the species had nested in Virginia but inquiry to Messrs. Scott and the present manager of the Chincoteague Refuge, Jacob Valentine, revealed that although intensive search had been made, no nests had been discovered.

Ontario (Canada). Under date of May 15, 1956, Mr. H. B. MacMahon of London, Ontario, wrote me, enclosing newspaper clippings of the first record for the cattle egret in that province. A single bird was seen by Misses Gladys Hutchinson and Winona Stewart of Brantford, during the first few days of May 1956. It was frequenting the Long Point area nearby and was seen by numerous observers during the following several days. Its appearance caused a sensation. Actually this bird is the first record for Canada, although in the autumn of 1952 a specimen flew aboard a fishing vessel off the Grand Banks of Newfoundland, was shot, and preserved. This was the bird shown to Messrs. Roger T. Peterson and James Fisher on their trip around the perimeter of North America. Since the vessel was some 200 miles at sea at the time, it hardly seems reasonable to assign Newfoundland as an area involved. The cattle egret seen in the Long Point area is the first for the mainland of Canada.

The second Canadian record—also from Ontario—was a single cattle egret seen by Dr. Miles D. Pirnie, on Dover Marsh, near the Lake St. Clair shore.

Thus far, we have traced the 1956 status of the cattle egret from Florida northward. Now returning to the Gulf Coast, this report moves west.

Alabama. No reports.

Mississippi. No reports.

No explanation can be offered to account for these gaps except the scarcity of observers. There is a tremendous area along the Gulf Coast in which even sight records of the cattle egret are lacking. It has not yet been reported between Panacea, Florida (which is almost due south of Tallahassee) and western Louisiana.

Louisiana. Cattle egrets first appeared in Louisiana in the fall of 1955 (October 17) when more than a hundred were noted in Cameron Parish. Dr. George H. Lowery, Jr., collected the first specimen in early December of that year. He wrote me, during the early summer of 1956, that the species had been, and was nesting in Louisiana and that he had visited the rookery, advising me at the time to communicate with Dr. Claude Lard of the Sabine Wildlife Refuge. In response to my query, Mr. Lard replied that the "first signs of cattle egret nesting were noticed on June 2 of this year (1956)." From 50 to 60 pairs were nesting in the Lacassine Refuge, Cameron Parish. In the letter from Dr. Lowery (June 20, 1956) he states that "Responsibility for finding the first nest of cattle egret in Louisiana, and presumably the first nest in the U.S., outside of Florida, goes to Mr. Claude F. Lard, Manager of the Sabine Wildlife Refuge, and to Mr. Lawrence Weinland, one of his assistants."

Texas. A discussion of the first record of the cattle egret in Texas appeared in the *Bulletin of the Massachusetts Audubon Society*, February 1956, p. 66. An apparent discrepancy was resolved, I hope, in that account. To keep the record clear, the first observance was by Mrs. William B. Keeling of San Antonio, who saw "many" at Eagle Lake, U.S. Highway 90-A, on August 18, 1954. Several birds were seen near Rockport November 25, 1955, by Mrs. Jack (Connie) Hagar et al. This was thought to be the first record then, none of the observers being aware of Mrs. Keeling's find.

On March 25, 1956, the cattle egret was seen at Galveston by John Hildebrandt (see *Audubon Field Notes*, Vol. 10, June 1956, p. 264).

Thinking that there might well have been a nesting record for Texas in the spring of 1956, I wrote to Mrs. Hagar. She replied, under date of June 27, 1956 in part, as follows: "The five egrets (cattle) seen here (Rockport) and on Mustang Island that I wrote you about, have not been recorded since March 23. They were here for five months, that's the last I know of them. If there is any nesting I have not found it, nor has anyone reported seeing an adult."

SUMMARY

The cattle egret nested for the first time outside of Florida, in the breeding season of 1956.

Breeding Records

South Carolina: Charleston Harbor (Drum Island). E. A. Williams and Philip Staats.

North Carolina: Mouth of Cape Fear River (Battery Island). T. L. Quay and D. Adams.

Louisiana: Lacassine Refuge, Cameron Parish. C. F. Lard and L. Weinland.

West Indies: St. Croix, Virgin Islands. G. A. Seaman.

Three of these locations were in salt water—Virgin Islands, North Carolina, and South Carolina.

The first salt-water location known in the United States was on Gull Island, Florida, in the Gulf of Mexico in 1955, and again in 1956 (H. L. Stoddard).

Of the seven known nesting locations in the United States and one in the West Indies (a total of eight) four were in salt water.

All of the nesting records outside of Florida occurred in May and June, 1956.

The first cattle egret nest in North America was discovered May 5, 1953 by Samuel A. Grimes and Audubon Warden Glenn Chandler, in Lake Okeechobee, Florida.

The first set of eggs of this species was collected May 30, 1953 and is now in my possession.

Other "First Records"

The first cattle egret collected in the United States was gotten in Massachusetts on April 23, 1952 by Messrs. Drury, Morgan, and Stackpole.

The first cattle egrets banded in the United States were 59 young, banded by Louis A. Stimson, then of Miami, Fla., at the "source" rookery in Lake Okeechobee, June 7, 1955. Three young of the Battery Island rookery, North Carolina, were banded June 23, 1956 by Messrs. Funderburg and Adams.

The first painting of the cattle egret in the United States was done by John Henry Dick, and exhibited at the Los Angeles meeting of the American Ornithologists Union in 1953. It appeared as the frontispiece of "Florida Birdlife," 1954.

The first photographs of a cattle egret were taken by Richard Borden, March 12, 1952.

CONCLUSION

Specimens of cattle egrets for the scientific record have been secured in the following states: Maine; New Hampshire (handled and released); Massachusetts; North Carolina; Florida; Louisiana.

Sight records of cattle egrets have occurred in the following states, including those above: Rhode Island; New York; New Jersey; Maryland; Virginia; South Carolina; Missouri; Texas; Illinois (?).

The future of the cattle egret as a nesting species in this country seems assured. Quoting T. L. Quay from a manuscript he sent to me in August, 1956: "One of the factors in the increasing spread of the cattle egret may be a high order of dominance in its relation to other herons." Mr. Quay gives as a reason for his belief, the behavior of the two pairs at the Battery Island, North Carolina rookery. Herbert Stoddard also told me this in 1954, and all observations made at the "source" rookery in Lake Okeechobee have borne out the beliefs of Stoddard and Quay. There seems to be no particular competition between the cattle egret and our native herons but the cattle egret will not be pushed aside or intimidated by any native North American heron as far as observations have revealed. It is an independent, vigorous bird, and it is well able to take care of itself, without exhibiting an undue amount of pugnacity.

What does 1957 hold for the further spread of the cattle egret in North America? Only the coming months will reveal the answer. Anything of importance which may transpire this fall of 1956 and too late for inclusion in this report will necessarily have to appear in some later account. I hope that all bird-watchers will help in tracing new records of the occurrence and nesting of the cattle egret on this continent.

—THE END.

A FAST ELECTRONIC EYE FOR



By Edwin J. Howard and
John C. Marchant

THE development of electronic flash has created new possibilities in nature photography, especially in photographing birds in action. Electronic flash is produced by a gas-filled tube through which is sent a powerful current of electricity. The result is a miniature bolt of lightning—an intensely bright flash of light lasting from 1/3,000th sec. to 1/10,000 sec., which floods the moving bird, and registers it on the photographer's film. If you take a picture with a light of such short duration as this, you register on your negative only the action that takes place during the flash. What this amounts to is that you stop, or "freeze," very rapid action—such as that of a bird in flight. But the mere owning of an electronic flash outfit will not automatically assure you of getting good bird pictures—or, indeed, of getting any bird pictures at all. The birds come to and leave the bait, on a tree or a log, but a bird in flight moves very rapidly. To get a good-sized image of the bird on the picture negative, the camera must be close to the bird. Because of this necessity, the bird passes across the small field of the lens in the fraction of a second. In the beginning, this created a problem, but we have worked this out so that anyone can easily photograph swiftly-moving birds.

The pioneers with electronic flash in bird photography set off their cameras by hand, usually by a long wire connected electrically to the

camera shutter, which the photographer set off from his position some distance away. This meant that the photographer had to anticipate the progress of the bird toward or away from the bait. He had to start to squeeze his shutter release long before the bird was where he wanted it to be. You have heard of "lightning-fast" human reactions, but actually, when dealing with something as fast as a bird, human reactions are very slow. So the pioneers sometimes got pictures, but more often they scored clean misses.*

The next step in bird photography was the use of the "electronic eye" to release the camera shutter to take the pictures, but the electronic eye available to the ordinary photographer was, and still is, entirely too slow for satisfactory bird photography. It has almost as slow a reaction to a bird crossing before the camera lens as that of an ordinary human being. A recent writer on the subject of bird photography stated that his electronic eye has a lag of

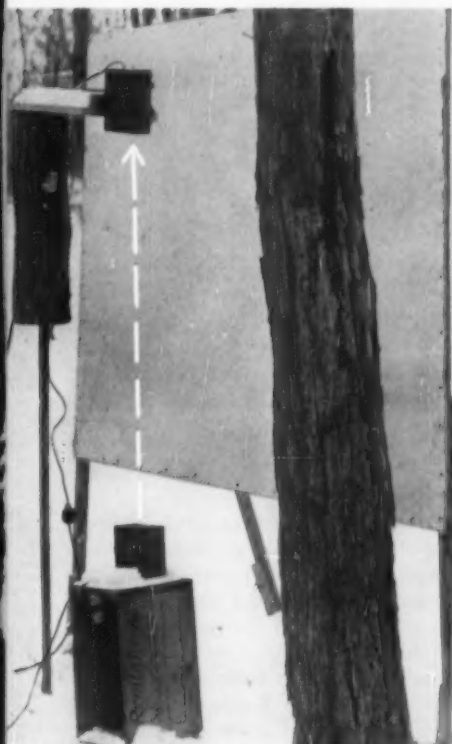
6/1,000th (six-one-thousandths) of a second, thus making it necessary for him to anticipate the progress of the bird in setting up his apparatus. It can readily be seen that such a time lag, in tripping the camera shutter, made it impossible to photograph swiftly-flying birds. The photographer could get almost any type of picture of a bird *approaching* a baited spot, but he could not photograph it at the moment of leaving the bait, because of the lag in the slow electronic eye.

We were much interested in learning how a bird—a woodpecker, for example—left its position on the side of a tree and got into flight. The human eye cannot record the series of movements that the bird goes through in doing this. One moment the bird is on the tree, facing it; the next moment it is in full flight away from the tree, and the human eye and brain cannot record what happened. A hand-released shutter and flash are entirely impractical for recording these movements, as the bird is *always* far away from the bait log and in full flight before a human

* For an interesting discussion of pioneering in electric flash photography of birds, see "The Electric Current in Bird Photography," by Guy A. Bailey, *Bird-Lore*, March-April 1914 issue. Many of our readers may not have old copies of *Bird-Lore*, but some local libraries, and many of the big city libraries, have complete sets of *Bird-Lore*, the predecessor of *Audubon Magazine*.—The Editor.

BIRD PHOTOGRAPHY

All illustrations by the authors



PHOTOGRAPH 1. The bait log (at left) with the electronic eye (upper black box) and source of the light beam (lower black box), in place. The tree (at right) is the point from which birds take off to fly to the suet in the bait log at left.

A Portable Electronic Flash

The electronic eye described in the accompanying article can be used to trip the shutter of a camera attached to an ordinary flash gun; an electronic or "speed" flash outfit; or no lights at all. But for good pictures of small birds in flight close to the camera, electronic flash is practically a necessity. Electronic flash outfits vary as to the amount of light emitted and the duration of the flash. The ordinary portable electronic flash outfit used by amateurs, which can be bought for about \$40.00 and upwards, operates at a speed of from 1/3,000th to 1/5,000th of a second. This outfit will take pictures like the one of the chickadee in flight, which was taken at 1/3,000th of a second, when the bird's wings are temporarily in a position of comparative rest.

A fine battery-operated portable outfit can easily be built by the home craftsman by following the simple instructions in the *Sprague Electronic Flash Handbook*, published by Sprague Products Co.,

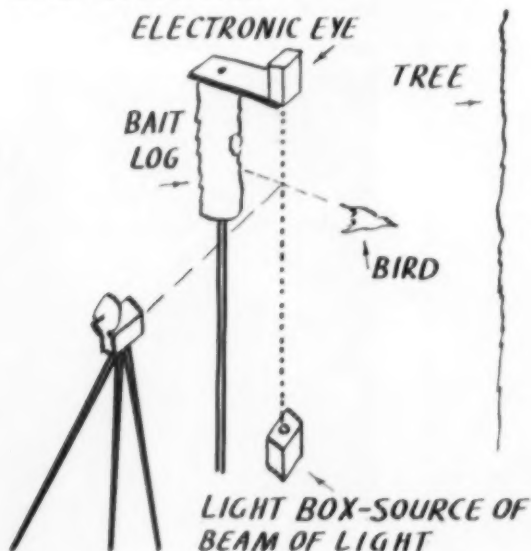
North Adams, Mass., 35¢. A larger and faster outfit may be built by following the directions in *A Universal Power Pack for High Speed Electronic Photo-flash Tubes*, published by Thordarson Meisner Mfg. Division, Maguire Industries, Inc., Seventh and Bellmont, Mt. Carmel, Illinois, 15¢.

The outfit we use is the Thordarson Meisner unit described in this booklet, with two Anglo flash tubes. One Anglo used alone has a speed of 1/10,000th of a second; by using two, we get a speed of 1/20,000th of a second.

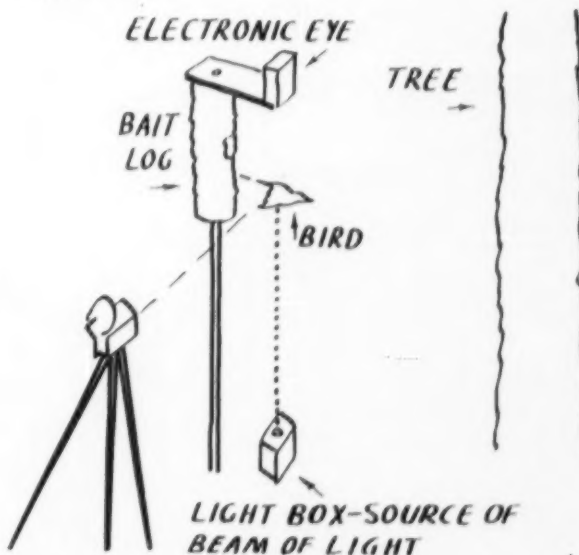
Anyone wishing to increase the speed of an electronic flash outfit (that is, produce a flash of shorter duration) can do so by adding flash tubes to the power pack. Using two tubes instead of one will cut the duration of the flash in half, but the total amount of light produced remains constant. Thus a 1/5,000th of a second portable outfit can be transformed into a high-speed of 1/10,000th of a second outfit by using two tubes instead of one. —THE AUTHORS.

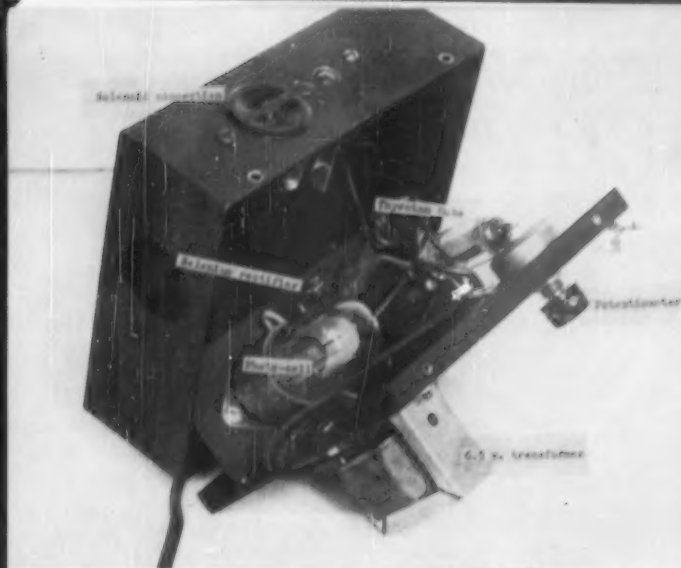
This tree-trunk perch thus "controls" the flight. The bird in flying from the tree trunk to the bait log breaks the light beam and takes its own photograph. (Light beam is shown by the white, broken line.)

SKETCH A. The slow electronic eye allows the bird to escape. The slow eye does not respond fast enough to set off the camera and take the bird's photograph while it is still within the camera's field of view.



SKETCH B. The fast electronic eye "captures" the bird. The fast eye responds so quickly that it sets off the camera and takes the bird's photograph while the bird is still within the camera's view.





PHOTOGRAPH 2. Case opened to show the parts of the electronic eye within. The main change that the authors made to speed up the action of the eye was to replace the slow mechanical relay with a thyratron tube. The tube acts as a fast, split-second electronic switch.



PHOTOGRAPH 3. Case opened to show parts (at bottom) of the electronic eye which do not show in photograph 2. The metal disk attached to the bottom of the case, with a small threaded hole in its center, can be used to mount the electronic eye on a tripod.

being can set off the apparatus. So to record these extremely rapid movements we bought an electronic eye kit which uses a mechanical relay.

The electronic eye is the device that automatically opens doors, counts automobiles passing a given spot, operates burglar alarms, and such things. It works by means of a special electronic tube called a photo-cell. When a beam of light falls on the filament, or cathode, of the photo-cell, an electrical current is generated. The current thus generated is used to hold *open* some kind of electric switch that has a

PHOTOGRAPH 4. The fast electronic eye set up for action. It is so sensitive that a pencil flicked across the light beam entering the box is sufficient to set the mechanism in motion which trips the shutter of the camera. If a bird, instead of a pencil, breaks the light beam, the bird's picture is taken instantly.



natural tendency to close itself. If the light beam falling on the filament or cathode is broken by an object passing through the light, the photo-cell immediately stops generating electricity, and the switch automatically closes itself. This switch can be used to turn on any sort of electrical device.

We put our kit together and set it up at the feeding station. The bait log consisted of a chunk of firewood—a piece of the limb of a tree—with two holes bored in it (see photograph No. 1). One hole is in the side, and into this one we put suet to attract the birds. The other one is in the end, and this one we fit over a gas pipe driven into the ground. This set-up is six feet from a tree (see photograph No. 1, and sketches A and B). The tree is very important in the arrangement of our apparatus, as the birds coming in to the bait almost always alight on it and then fly over to the bait log. When they leave the bait log they fly back to the tree. Thus, they follow a narrowly defined path, either in approaching or in leaving the bait. We use the piece of firewood for the bait log so that the approaching birds are forced to land in a limited, or restricted space and so come into the field of the camera lens. All of these details about arranging a narrow path to be followed by the birds are important, because to do photography of any kind you must have the bird in focus. Therefore, the camera must

be in position, the lens focused, and the shutter cocked to take the picture *before* the bird appears at the spot. As you cannot locate the bird in the finder and do your focusing *after* the bird appears, you must focus on one particular spot that it will surely occupy when it finally does appear.

Our original electronic eye made from the kit was completely useless. It would have been fine to record the movements of automobiles or burglars, but it reacted so slowly that it was totally inadequate for birds in flight. So we tinkered with it, removing some parts and adding

PHOTOGRAPH 5. The cylinder-shaped solenoid, or "electrical trigger," taped into position, and wired to the camera shutter. When a pencil is flicked across the light beam (as shown in photograph 4), or a flying bird breaks the beam of light, an electrical current passes to the solenoid on the camera, which trips the shutter and takes the picture.

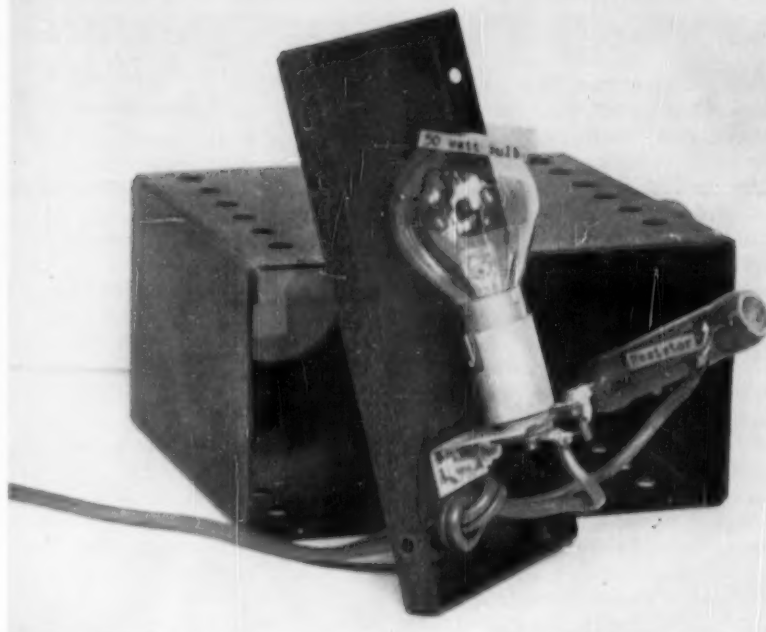


others. The main change was to replace the slow mechanical relay with a thyratron tube (see photograph No. 2), which is an instantaneously acting electronic switch. The result of our experiments was that we finally developed a fast, stable eye; it is so sensitive that flicking a pencil through the beam (see photograph No. 4) will trip the shutter and lights. The time lag is (photographically speaking) zero; when a bird is in the beam, its picture is taken right there. One of the best things about it is that it is very simple to construct.

We use the electronic eye to set off a solenoid, which is an electric-shutter tripper. The solenoid, in turn, sets off the camera shutter (see photograph No. 5). The solenoid that we use is a 115-volt industrial, which is capable of picking up a weight of eight ounces; it is far more satisfactory than the usual 6-volt photographic solenoid, as it is more powerful and it cannot get out of adjustment. It is plugged into a wire that connects to the regular house current that runs the electric eye and the electronic flash (see photograph No. 7). It has the added virtue of costing a fifth or a sixth as much as a good photographic solenoid does. Our camera shutter is an ordinary flash shutter synchronized for X delay, or, in other words, electronic flash; it is the type of shutter commonly found on moderate-priced cameras. The flash contacts of the shutter are connected by an electric wire to the electronic flash unit. This part of the set-up is exactly like that of the popularly owned flash camera, except that we use electronic flash instead of the familiar flash bulbs.

Our hook-up of the electronic eye to the solenoid, which trips the shutter, which, in turn, sets off the lights, sounds bewilderingly complex, and, to tell the truth, it is a bit involved. But it provides a way of taking pictures that can be taken in no other way.

Anyone who can use a soldering iron or a soldering gun and a pair of long-nosed pliers can duplicate our electronic eye (see photographs Nos. 2 and 3). The materials are all standard products available at electronics supply houses. When connecting up the various parts you must leave enough wire between the sockets, the transformer, and the potenti-



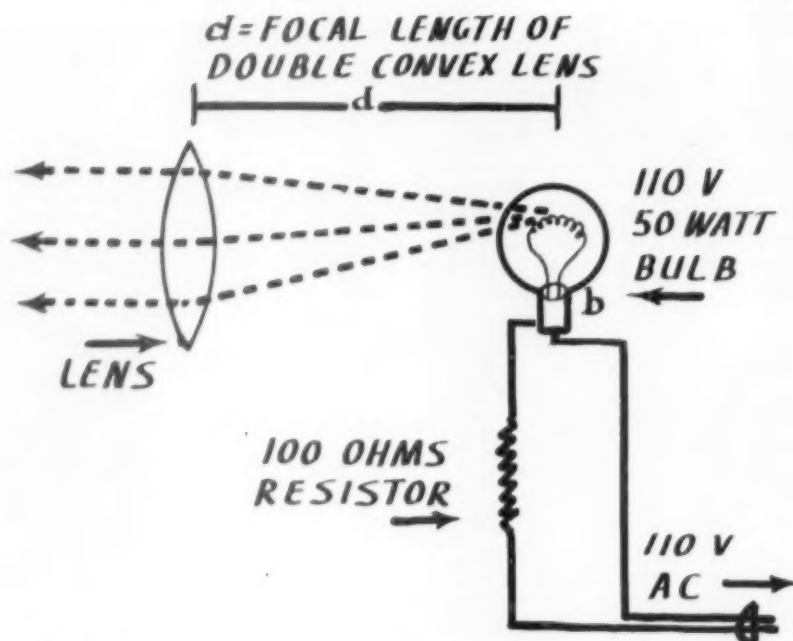
PHOTOGRAPH 6. The electronic eye, shown in photographs 2, 3, and 4, requires a beam of light to make it operate. The source of this light (shown in the case above) is a 50-watt electric light bulb and a lens which is set in a hole drilled in the front of the light-box. The most important adjustment of the light-source box is to make sure that the lens is focused properly (see sketches E and F on the next page).

PHOTOGRAPH 7. The complete set-up. The camera is in position and is focused on the point where the bird, in flying from the tree to the suet, will intercept the light beam and take its own picture. (Light beam is shown by white, broken line).



ometer (which is the device with the knob used to set or adjust the eye to various levels of light) to mount them in the holes you drill for them in the case. You must insulate the bare wires and connections with electrician's tape, and then you can simply push the wires, resistors, capacitor, and rectifier into the case and juggle them around until the case will close.

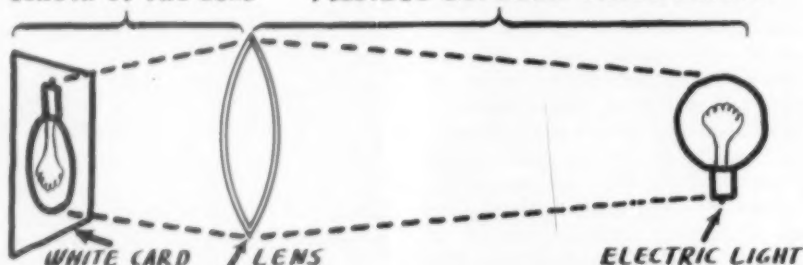
The light source is very simple to construct (see photograph No. 6 and sketch E). The chief thing is the focusing of the lens. Any double convex lens, such as that from a magnifying glass, will serve the purpose. You can get good ones from surplus houses dealing in optical goods. You need one from an inch to an inch-and-a-half in diameter, with a focal length between three and four inches. Find the focal length by moving a white card and the lens until a distant object sharply focuses on the card (see sketch F). The distance between the lens and the white card is the focal length of the lens, and the light bulb of the light-source should be fixed at this distance from the lens. As a finishing



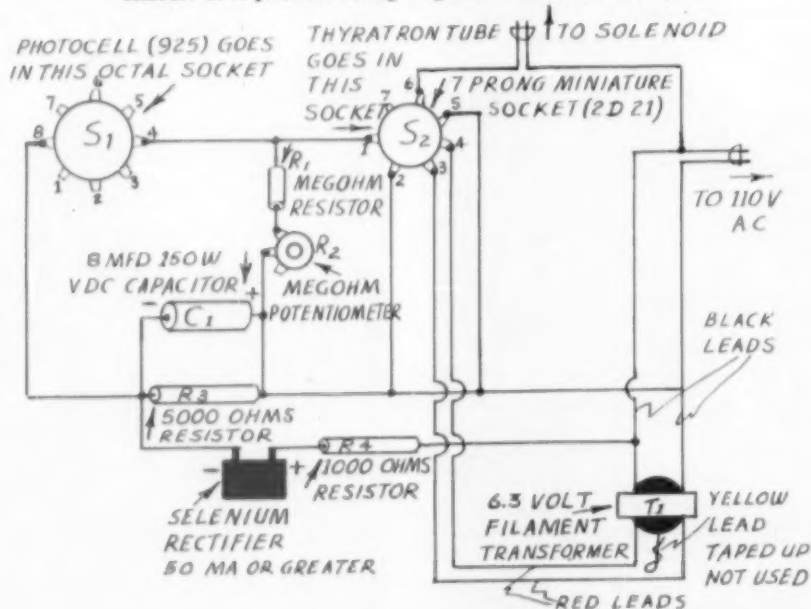
SKETCH E. The wiring diagram for the light source. This is shown within its box in photograph 6.

SKETCH F. To find the point at which the lens focuses sharply, move a white card back and forth in front of the lens until the light shining through it focuses clearly on the card. Then measure the distance between the card and the lens. This is the distance (within the light-source box) that the light should be set away from the lens in the front of the box.

THIS IS THE FOCAL LENGTH OF THE LENS HAVE AS MUCH DISTANCE AS POSSIBLE BETWEEN THESE POINTS



SKETCH G. A pictorial wiring diagram of the electronic eye.



ABOUT THE AUTHORS

Dr. Howard, the senior author of this article, was graduated from Cornell University where he received degrees in English, with all the sciences—chemistry, geology, physiography, entomology, botany, etc.—that could be crowded in. Dr. Howard is a professor of English at Miami University, Oxford, Ohio. He has published books on mediaeval and Elizabethan literature, and a large number of articles on photography, fishing, and fishing tackle. He began his photographic work with praying mantises in his backyard, and has exhibited his photographs in salons in America, England, South Africa, and Eire. Dr. Howard highly recommends that beginners enter their photographs in exhibitions "as there is no better teacher of technique than preparing large salon prints."

Mr. John Marchant, the junior author of this article, is a research scientist at Eastman Kodak Laboratories where he got his position largely through his interest in, and knowledge of, electronics in nature photography.—The Editor.

touch to the light-source box, you should drill a row of holes along the sides at the top and the bottom of the case to provide for ventilation and cooling.

Another detail worth mentioning is the device used for fastening the cases containing the electronic eye and the light source to tripods. We use discs of metal drilled and tapped with $\frac{1}{4}$ 20 threads, which fit tripod screws, and also drilled with a couple of holes by means of which we screw the discs to the bottom of the cases with self-tapping or sheet-metal screws (see photograph No. 6).

Any electronics supply house has a variety of metal equipment cases that can be used for containers for the two units. The ones we use are $4\frac{3}{4} \times 4\frac{3}{4} \times 2\frac{1}{2}$ inches for the light

box and $5 \times 6 \times 2$ inches for the electronic eye, but any boxes of about these sizes will be satisfactory. It is, of course, entirely practical to make wooden containers for the two units, but the ready-made metal boxes are convenient and cheap.

If you do not feel capable of doing the wiring yourself, you can get anyone who is familiar with radio or television to do the work for you in a very short time. But there is nothing difficult about it and anyone should be able to do it.

In setting up for picture-taking, place the box with the electronic eye and the box with the light source so that a beam from the light source shines into the hole in the eye box behind which sits the photo-cell, which must be aligned so that the filament, or cathode, is towards the

hole (see sketches A and B). The beam of light should be so positioned that birds passing to and from your bait will break the beam and so set off the lights and the shutter. And, incidentally, although we keep talking about setting up in front of a bait log, you can set up in front of a nest, a birdbath, or in any other spot frequented by birds. Connect the electronic eye to your solenoid or camera tripper, and run a wire from your shutter flash contacts to your electronic flash. Then with the round knob of the potentiometer adjust the eye, after it has warmed up, so that it will trip the shutter when the beam of light is broken. You can get the proper adjustment by slowly turning the knob and passing your hand rapidly through the beam of light. The best way to get

Continued on Page 291

★ ★ ★ NATURE IN THE NEWS ★ ★ ★

Reprinted from the New York Herald Tribune, September 17, 1956

During Migratory Season Empire State Turns Off Beacon to Save Birds

The stationary beacon light on the Empire State Building was extinguished last night for the bird-migrating season on the theory that it attracts birds that dash themselves to death against the sides of the world's tallest office structure.

The building's spectacular "freedom lights"—revolving beacons that were installed May 3—will continue to burn and revolve, however, as they are not considered a fatal attraction to the birds, according to the building's management.

Almost every year, hundreds of song-birds flying south for the winter crash against the night-shrouded upper stories of the Empire State Building. More than 300 of them perished in this manner on October 19 last year.

The stationary light will remain off until November 1, according to a representative of the building, who quoted an official of the National Audubon Society as saying that the migration season would end before then.

The announcement quoted John K. Terres, editor of *Audubon Magazine*, as saying that the Empire State Building is located on a migratory route known to scientists as the "Atlantic flyway." From now through mid-October, sparrows, warblers, thrushes, towhees, wood-

peckers, woodcock, and snipes will be migrating from eastern Canada, New England and New York to warmer climates, he said.

Photograph courtesy Empire State Building Corporation.



Reprinted from the New York Daily News, September 17, 1956

LIGHT GOES OUT FOR MIGRATION

To safeguard birds on their annual migration to the South, the stationary all-night beacon atop the Empire State Building was doused last night and will be kept off until November 1. Seems that the building is on the Atlantic Flyway and the stationary beacon is a traffic hazard.

The National Audubon Society said Empire State's gesture was just fine.

Reprinted from the New York Times, September 17, 1956

Empire State Beacon Shut Off to Save Birds

Migrating birds will get an assist from officials of the Empire State Building.

They announced yesterday that the structure's stationary all-night beacon would be turned off "immediately" until Nov. 1 so the current masses of migrants will not become dazzled and fly into the building in confusion.

They said the "freedom lights," which revolve at the base of the tower, would continue in operation until midnight as customary, because they are not considered a menace to birds. The all-night beacon, the light on the south side of the structure, throws a horizontal beam downtown from midnight to sunrise.

Last Oct. 19, 156 migrating birds and two bats crashed into the building and were killed. A year before 123 birds and four bats struck the building.



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How to Attract Birds



A Wildlife Feeding Station in Arkansas

By Cora Pinkley-Call

OUR backyard is the focal point of our seven-acre bird sanctuary in Mill Hollow, a suburb of Eureka Springs, Arkansas. One can look out at any hour of the day and see from one to a dozen or more of the hundreds of birds which come there to nest and rear their young.

Our original one-acre hillside home-site has served as a feeding station to all the birds in Mill Hollow for 36 years, ever since we have lived there. Ten years ago we were able to buy six acres of the cedar-covered hillside across the road from our home. We had always wanted it in order to protect the birds and other wildlife there, and the native flowers, trees, and shrubs which grew there so abundantly.

Owning a few acres of my native Ozarkland, which I might convert into a bird and wildlife sanctuary, was a dream come true. From the time I left my mountain bounded valley in the Ozark hills, I had looked forward to the time when I could retire to the hills and have my childhood bird friends around me, as we had them at the old homestead. The call of the bob-white quail, the whistle of the cardinal, and the song of the mockingbird were the sounds that were woven into the very woof and warp of my childhood.

Had I hunted the world over, I perhaps could not have found a more ideal location for a bird sanctuary than in Mill Hollow, which nature had so richly endowed with the three "musts" if one is to have the birds—water, food, and nesting sites. These Mother Nature had supplied in my chosen retreat.

Growing on our one-acre homesite are seven mulberry trees. The white mulberry bears early, and one of the ones with purple-black fruit bears during August. Clumps of elderberry shrubs grow around our home and provide food from the middle of July until September for the birds. Many birds gorge themselves on these and pokeberries before taking off on their long fall flight. We have a hackberry tree which bears fruits that are relished during the winter by many kinds of birds. A row of coralberries, commonly called buckbrush, grows in abundance out of our rock walls and is scattered about over the place. There is a row of it just above the house, which makes a beautiful splash of color throughout the winter, and supplies food for cardinals, towhees, sparrows, finches, and many other birds. The berries are indeed lovely sticking up through the snow with a blood red cardinal clinging to them gleaning his breakfast.

Just a few feet farther up the hillside is a large blackberry tangle which supplies food throughout the late spring and summer. It also provides nesting places for the birds that prefer seclusion and low nesting sites. Just above the blackberry tangle is a honeysuckle covered cave. The honeysuckle has covered the entire hillside, clambering at will up trees and shrubs, providing both winter food and shelter. This is the favorite haunt of Jerebel, our mockingbird, so named from her pugnacious disposition when other birds dared invade her winter domain and take a few of her hoard of honeysuckle berries. I am sure that this sheltered domain and her favorite berries were the great factor in her re-

Turn to Page 286

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maining here through the winter when most mockingbirds go farther south.

We have allowed a pear thicket to grow around a large pear tree near the cave, where a wood thrush has nested every year since we have been here. Other birds—catbirds, chipping sparrows, cardinals, towhees, and other lower nesting birds—prefer the pear thicket. This vine-tangled retreat is an ideal place for birds, where 30 or more nest each year. Seven black walnut trees furnish nuts for the nut-loving birds. I have found that practically all of the birds that remain here throughout the winter will eat cracked nuts, with perhaps the exception of the bluebird and mockingbird.

Besides these native shrubs, vines, and trees, we keep our backyard supplied with grain throughout the summer where hundreds of birds come and eat with our bantam chickens. Among these are cardinals, as many as a dozen eating at one time, towhees, brown thrashers, wood thrushes, mockingbirds, catbirds, sparrows, and blue jays.

I also plant sunflowers, zinnias, and marigolds, all of which I leave standing for the finches, sparrows, and other seed-eaters during the snowstorms when food is hard to find.

Birds do not like a place that is too spick and span and will not build near you unless they can find seclusion. I provide hollow loghouses for the bluebirds, chickadees, and titmice. If I can't find hollow logs, I provide rustic boxes made from slabs.

Dense brakes of red cedar cover the six-acre, steep, hillside sanctuary opposite our home, providing both food and shelter for birds. Many birds live almost wholly on the blue cedar berries during the winter. Among them are the cedar waxwing, which we have here in abundance. It is a beautiful sight to look at the dark green cedars aswarm with the blue, red, brown, and gray birds on a cold snowy day as the birds glean their food. Also growing in abundance on the hillside are the red and orange yaupon or Ozark holly, as it is called by the natives. Wahoo shrubs with their four-celled red berries, black haws, red haws, and persimmons add to the festive winter board. We gather boughs from these shrubs and trees during ice or heavy snow and bring them in and thaw the ice off, then stick them down in our porch boxes where the birds flock for food during the winter. I never could succeed in tolling the mockingbirds and bluebirds to our winter feeding-shelf until quite by accident I laid down some of the cedar and yaupon boughs on the porch box at Christmas-time. Later I heard a commotion on the porch, and found birds fighting for the berries. To my great surprise, foremost in the fray were the mocking-

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birds and bluebirds. From that time on my porch boxes bloomed with berries and birds. Jezebel, the mockingbird, became so tame that she would sit on the screen door propped back against our front window and peer into the house . . . and if there was no food, she would scold until we put some out for her.

Another great drawing card for our small sanctuary is a cold, cave-born spring that flows from our hillside. There is also a brooklet that flows just below our home the greater part of the year, except in dry, hot weather. Then I supply water in my backyard where the birds come to drink and bathe. We have no cats, so they can bathe quite unafraid. They peer up at me with bright, beady eyes as I talk to them from a few feet away. They may not know what I say, but they certainly know that I am their friend, and have no fear of me. Many of them come into the house every time they find a door or window open. It is not unusual to have the cardinals, the Carolina wrens which build in our home, and the bluebirds, come into the house and take crumbs from the floor or table.

Birds know instinctively who their friends are, and kindness in the way of food and shelter is a language that wild birds and all other animals understand.

Birds are by no means the only interesting visitors that we entertain in our backyard. Frequently we see wild rabbits eating or playing around the house, or a groundhog. Ground squirrels occupy a home in our rock garden just outside a quartette of windows, where their little ones come out and play like kittens.

There is no end to the drama and free entertainment furnished by our seven acres of wildlife, which more than repays us for the expense and effort we have put into it. If one is bored with life, or dreads old age, just forget it by establishing a wildlife feeding station. There will be no more dull and gloomy days during the winter months, which is the best time to establish a window feeding-shelf, as the birds are more dependent on us at that time. **THE END.**

BIRD'S EYE VIEW—Continued from Page 251
be developing a more attenuated strain, both in England and in Australia, a strain that does not kill as high a percentage. It is believed that the disease will eventually become endemic and that the rabbit will be stabilized at a level less dangerous to the permanence of biotic communities than that which existed before the epidemic. This must have happened in past centuries to the New World rabbits.

Let me add that it would be a mistake to introduce European rab-

bids into this country as certain sportsmen have advocated (and have actually done locally). We cannot foresee the end results of such introduction, but I suspect, though, that our cottontail would win, on its home ground, any struggle for survival with an exotic so similar as the European rabbit. The two are in effect, replacement species, even though the taxonomists put the latter in the genus *Oryctolagus* instead of *Sylvilagus*.
—THE END.

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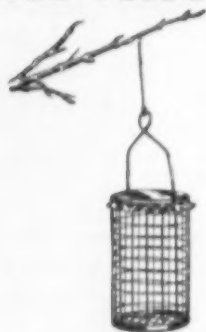


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The Birds' Christmas Tree

By Gertrude Maier

EVERY child loves a Christmas Tree. At first the surprise of having Santa leave the tree adds to the joy. Later the art of trimming it gives a thrill. If trimming a tree for children is a thrill, trimming one for birds is equally so, thought Mr. Lindley Vickers, Park Naturalist, Mill Creek Park, Youngstown, Ohio, and his father, Mr. E. W. Vickers, retired Park Naturalist.

Mr. Vickers leads a group of hikers through the park every Sunday afternoon. Careful consideration is given to the appropriateness of the season in planning these trips. Therefore, Sunday, December 6, 1953 became the first "Birds' Christmas Tree" hike.

At 2:00 p.m. 33 hikers, both young and old, left the Old Mill Museum in Mill Creek Park. Each carried his string of popcorn, cranberries, nut meats, combinations of popcorn and cranberries, macaroni broken into one and one-half inch pieces which alternated with cranberries,



Photograph by Gertrude Maier.

cubed apples, and squares of bread. One woman had a long string of Cheerios, evenly spaced and tied in place. There was bread cut into the shapes of bells, stars, balls, doughnuts, and Santa Claus; much suet, whole apples, prepared food trays to clip on for small birds, and corn on the ear for larger birds. Everything that Youngstown's winter birds will eat was there.

The roadway led to a 14-foot Norway spruce in an area where the food supply from crabapples, pine cones, and other native fruit was nearly exhausted. By the aid of a ladder and a long forked stick, the hanging began. Everything was hung with as much care as if Saint Nick had truly been there. Motorists stopped, stared, and slowly passed on. The hikers stood back to survey admiringly the shapely and bountifully trimmed tree.

After the tree was trimmed some of the hikers guessed as to how long it would take the birds to find and complete their feast. All of the guesses were wrong. Within 10 days the tree was stripped. —THE END

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Drawing by
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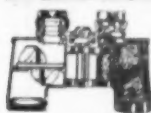
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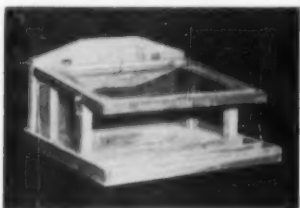
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THE RETURN OF THE VANISHING MUSK OXEN

Continued from Page 265

In April, 1927, the Legislature of the Territory of Alaska sent a memorial to the United States Senate and House of Representatives urging favorable action in appropriating funds to re-establish musk oxen in the range formerly occupied by them in Alaska. During May, 1930, under the active leadership of Senator Peter Norbeck of South Dakota, and Representative C. C. Dickinson of Iowa, an appropriation of \$40,000 was granted for the project. Administration of it was assigned to the Bureau of Biological Survey, U. S. Department of Agriculture, now the Fish and Wildlife Service, U. S. Department of the Interior. It was impossible at that time to obtain live specimens of any of the races of musk oxen that lived in North America. It was necessary to buy stock of the Ward's musk ox, which inhabits northeast Greenland. An order was placed with Johs. Lund, Aalesund, Norway, and late in August 1930, word was received that 34 animals, including 19 females and 15 males, had been captured. All were under two years of age and about half of them were calves of the year. (TO BE CONTINUED)

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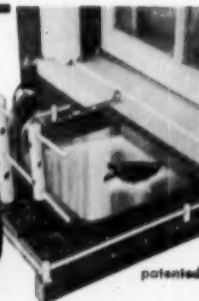
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| b ₁ Projection bulb—50 watts | 1.35 |

—THE END.

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BOOK



Notes

By Monica de la Salle
Librarian, Audubon House

WE ARE leading off our book notes in this issue with a guest review by Dr. Paul A. Zahl, distinguished author of "Flamingo Hunt" (Bobbs-Merrill, 1952), a book in which Dr. Zahl told of his field work with flamingos between 1946 and 1949. In 1949, Dr. Zahl headed the National Geographic Society's Venezuelan Expedition, aimed at discovering the breeding grounds of the rare scarlet ibis. The results of his adventures and researches on this expedition were published in his book, "Coro-Coro" (Bobbs-Merrill, 1954). We are pleased to have Dr. Zahl review for us Robert P. Allen's Research Report No. 5, about the flamingos of the Western Hemisphere, published by the National Audubon Society.

—THE EDITOR.

THE FLAMINGOS: THEIR LIFE HISTORY AND SURVIVAL

By Robert Porter Allen, Research Report No. 5, National Audubon Society, New York 28, N. Y., 1956. 10 1/2 x 8 in., 285 pp. Illustrated. Indexed. \$3.95.

"Their red-coated flocks are a spectacle of vast and stirring wonder. We might do well to give them, and the problem they face, a long, steady, and thoughtful look."

These lines conclude Robert Porter Allen's report on flamingos, but they might have served equally well as an introduction, for the opus represents indeed a "long, steady, and thoughtful look" at virtually all aspects of the flamingo problem.

That such a problem exists need hardly be emphasized for readers of *Audubon Magazine*. In its pages the President of the National Audubon Society and other conservationists have long been calling attention to the threat of extinction which of late years has hung like a dark cloud over *Phoenicopterus ruber*, the wondrous West Indian flamingo.

In 1951 the National Audubon Society designated Robert Porter Allen to study the ecological status of this species, to assay the present-day threat to the creature's survival, and finally to determine what measures could be taken to combat this threat. For nearly four years Mr. Allen dedicated himself to this task, and now has produced a report which will no doubt stand for many years as the work on flamingos, as well as a procedural format for conservationists in other fields. The volume, excellently laid out and beautifully illustrated, is scholarly without being ped-

antic, scientific without being obscurely technical.

Nearly a thousand bibliographic text references, representing our total knowledge of both New and Old World flamingo species, are assessed, integrated, and listed. Such a contribution to ornithological literature would in itself have justified publication of the report. Add to this Mr. Allen's detailed field study of the habits, food sources, distribution, and general natural history of the West Indian flamingo, together with his searching analysis of factors contributing to the flocks' decimation in recent years, and we have the substance of a most valuable work.

From the viewpoint of the National Audubon Society's long-term philosophy of conservation, the ultimate purpose of this project was to provide topical information which might serve as the basis for setting up a specific program of conservation, so that, as Arthur S. Vernay has hoped, "this great heritage will not be swept from the face of the earth."

The establishment of such a program for a species whose migrations and normal movements crisscross international boundaries is fraught with problems which, while complex and difficult, are certainly not insoluble. The present-day range of *Phoenicopterus ruber* includes the Bahamas, Yucatan, Cuba, Venezuela, the Netherlands Antilles, the Guianas, Haiti, the Dominican Republic, and certain other Caribbean areas.

Egg-collecting, hunting, disturbance by low-flying aircraft, unnecessary visits to flamingo colonies during the nesting season, etc., represent the sort of molestation that on many a Caribbean island has had so damaging an effect on the flamingo. Most such activities,

even on remote cays, could be prevented through the dissemination by locally served conservation groups of educational information and, when necessary, through the sponsorship by such groups of warden systems and the enactment and enforcement of protection laws.

As an auspicious beginning, a more or less model conservation group known as the Society for the Protection of the Flamingo has been set up in the Bahamas. Similar groups will no doubt eventually find their being in such other Caribbean countries as may be interested in conserving so appealing a natural resource as the flamingo.

The growth in the Caribbean region of a sustained and consistent "save the flamingo" movement may spell the difference between survival and oblivion for this most spectacularly beautiful of Western Hemisphere birds. If the "flaming flocks" are thus saved, the National Audubon Society and its monumental Allen report will deserve no small proportion of the credit for doing so.

—PAUL A. ZAHL.

SWIFT IN THE NIGHT, and Other Tales of Field and Wood

By William Byron Mowery, Coward-McCann, Inc., New York, 1956. 8½ x 5½ in., 254 pp. Illustrated with line drawings by Walter Ferguson. \$3.75.

Readers of past issues of *Audubon Magazine* will remember Mr. Mowery's articles, "Out of the Soft Black Night" (November-December 1952 issue), and "Mystery of the Big Hop" (July-August 1953 issue). In this book, a collection of articles and one fictional story, previously published in magazines, readers will recognize the skilled, professional writing, and the deep, sympathetic feeling for his subjects that Mr. Mowery invariably conveys when he writes of the out-of-doors.

The only fictional story in the 13 chapters is "Swift in the Night," which gave the book its title. It is a tender and appealing story of a family of red foxes, an animal about which Mr. Mowery knows a great deal, and shows an especial fondness for. There are chapters about such diverse subjects as raising baby birds ("The Lord's Tiny Poultry"); the behavior of cottontail rabbits and woodchucks; and hunting wild salads, mushrooms, and ginseng. Mr. Mowery's chapters, "Saga of the Wolf," are largely an exposé of the fictional propaganda about wolves that has been so much used in some American fiction magazines, and in newspapers. The author's interesting personal experiences with wolves in the Canadian Arctic make his account a particularly timely and appealing plea to save the wolf before it is too late.—J.K.T.

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AUTUMN ACROSS AMERICA

By Edwin Way Teale, Dodd, Mead and Company, New York 1956. 8¼ x 6 in., 386 pp. Illustrated. Indexed. \$5.75.

This volume is the record, ostensibly, of a 20,000-mile trip through the American autumn from Cape May and Cape Cod to Monterey and Vancouver. However, as readers of "North with the Spring" well know, Mr. Teale is incapable of producing a merely pedestrian diary. Everywhere he goes, and whatever he sees or looks for, a store of facts and associations is on tap, and what quite naturally comes to his mind is what we share. A night swim evokes the story of the disappearance and the equally mysterious reappearance of the eelgrass; a river reminds him of the discovery of the Kirtland warbler; a tree leads to an account of the migration of the monarch butterfly. Indeed, this is the way to travel, whether from an armchair or, book in hand, through the countryside Mr. Teale so enchantingly describes.

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IN FIELD AND MEADOW, by Etta Schneider Ress; IN FRESH AND SALT WATER, by B. Bartram Cadbury; IN CITY PARKS AND HOME GARDENS, by Robert S. Lemmon; IN FOREST AND WOODLAND, by Stephen Collins; IN THE DESERT, by Alexander B. Klotz and Elsie B. Klotz, Creative Educational Society, Inc., Mahkato, Minnesota, 1956. 5 volumes, 11¼ x 8½ in. about 185 pp. each. Illustrated. Indexed. Each \$6.95; set \$34.95.

Every open page of these volumes reveals a black-and-white photograph and a facing page of well-printed text. Plants, flowers, insects, amphibians, fishes, birds, and mammals for each habitat are represented, with special stress on the balance of nature and the interdependence of living things. The entire set is therefore an excellent introduction to nature for both children and adults. The "stories" are easy and interesting reading and the pictures are beautiful.

THEODORE ROOSEVELT THE NATURALIST

By Paul Russell Cutright, Harper & Brothers, New York, 1956. 8½ x 6 in., 297 pp. Illustrated. Indexed. \$4.00.

Of all Theodore Roosevelt's varied activities—as soldier, statesman, politician, writer, and naturalist—the last is perhaps least well known. Much has, of course, been written about his hunting and collecting expeditions and about the conservation program which many consider the major achievement of his presidency, but a biography treating in



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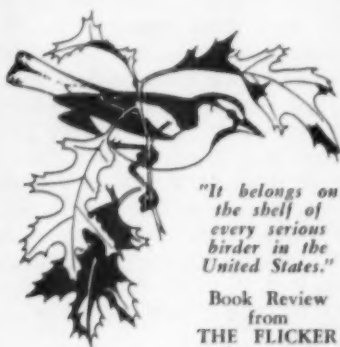
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By Boughton Cobb, Houghton Mifflin, Boston, Mass., 1956. 7½ x 4¼ in., 281 pp. Illustrated. Indexed. \$3.75.

This new addition to the Peterson Field Guide series maintains the high standards of its predecessors. The exceptionally lovely illustrations, drawn by Laura Louise Foster, show the complete fern in its full-blown fruiting state, with arrows to emphasize the distinguishing characteristics of the species. On the facing page information is given on the type and where it can be found, with a detailed description of leaves, axis, stalk, rootstock and roots, spores, fruit-covers and, often, the fiddleheads. A key for quick visual identification appears in the front of the volume, followed by an account of the life cycle of a fern. The author, a business executive with training in architecture and a lifelong interest in natural history, has collected and studied ferns intensively both here and abroad, and maintains a garden of them at his home in Connecticut.

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THE SANDERLING—Continued from Page 271

immediately and keep it up almost without interruption until the next high tide chases them into the air. They seem the winged embodiment of the tide—their flight a ripple, or a series of ripples, and their bodies are aerial minnows, dark above and glistening white underneath.

Myriads of these little beach waifs run round devouring minute crabs, algae, hoppers, sand-worms, and various marine insects. All feed eagerly but none can compete for an instant with those hungriest of sandpipers, the beautiful sanderling.* Sanderlings dash about as if they were famished, often holding their mandibles submerged to the nostrils but working them like scissors. You might think from the way they stuff themselves that they would burst, but you likewise realize why they are the plumpest of their order during the season of plenty.

In May and in early June, sanderlings pass along the New England coast bound for their nesting grounds in northern Alaska, the shores of the Arctic Ocean, and northern Greenland. They are cosmopolitan in their distribution, breeding also in Iceland, Spitzbergen, and northern Siberia. Their southern migration, during which we see them along our coasts in greatest numbers, extends to southern Patagonia in South America, to South Africa, Ceylon, Java, Borneo, the Philippines, Australia, New Zealand, and Hawaii.

Despite this wide dispersal, considerable numbers of sanderlings winter along our Atlantic coast in the middle latitudes, where they add a touch of life and beauty to the cold and deserted sands.

Although common on the inshore flats at low tide, sanderlings are pre-eminently the sandpipers of the sounding ocean beaches, and are appropriately termed "surf snipe." They prefer those vast, tide-scoured, rolling strands where breakers crash and roar. When the tremendous backwash seethes down the slope, bearing minute crustaceans and hoppers, these bold little birds dash after the water, snapping up the

tiny marine animals that kick themselves clear of the spume.

Often, too, sanderlings probe the hard, wet sand for sand-fleas, muskies, and other sea-spoil, leaving lines of holes two or three feet long and deep enough to survive the scouring of several waves. Following a flock of these birds along the barren, outside strand, it is pleasant to hear their contented peeping and whistling, and to watch them at a distance swarming over some rise in the sands.

At other times the observer may be surprised to see a flock spring from the margin of the sea, where their pale protective coloration renders them indistinguishable until they move.

Their heads and upper parts are somewhat rusty in the breeding season, with blackish back and scapulars and some gray. Their underparts are white, their bills short and black, and their legs are brown or black. Males and females look alike, and are from seven inches to eight and three-quarters inches long. They are the only species of American sandpiper lacking a fourth toe. In their

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* Other names for the sanderling are: ruddy plover; beach-bird; surf-snipe; white snipe; beach plover; whiter; and bull plover. The sanderling is a sandpiper, not a plover. Other American members of its family (Scolopacidae) are the woodcock; Wilson's snipe; dowitcher; all sandpipers (so-called); the knot; godwits; tattlers; willet; yellow-legs; and curlews.—THE EDITOR.

winter plumage, after the summer molt, sanderlings lose most of their rusty tints and look as gray and white as the sand on which they scamper.

Sanderlings lay their top-shaped, spotted eggs in hollows lined with dried grass on pans of clay or stone slightly raised above the surround-

ing tundra in the Far North. The young are said to be as precocial as most of the order are, and they run about and feed themselves soon after hatching. They are mighty travelers. As soon as they are fledged they start south and by midsummer become the commonest birdlife on the Atlantic coast.

—THE END.

THE TREE IN THE MEADOW

Continued from Page 269

grasses, sedges, and shooting stars still bloom. In the winter, with the coming of the deep snows, some of the animals like the deer, move down to the lower, warmer valleys, and the warblers, and the solitaires migrate to warmer climates; others, such as the golden-mantled ground squirrel and the lodgepole chipmunks, prepare to sleep the winter through; still others—the gopher and the provident pine squirrel remain—one the undisputed monarch below the earth, the other the ever-noisy jester above the ground.

As the cold winter moon casts blue shadows on the snowbound meadow, the horned owl sends a muffled mes-

sage to its mate in the Jeffrey pine up the ridge. Then it turns its head to watch with its great yellow eyes two meadow mice that are running over the snow, close to the safety of their warm nests beneath the tree that fell in the meadow. The full cycle of seasons, and of life, had turned, as a wheel spins, and as the earth circles in its orbit.

—THE END.

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DEER IN THE SNOW (3-8)

By Miriam Schlein, Abelard-Schuman Co., New York, 1956. 10½ x 7½ in., 42 pp. Illustrated by Leonard Kessler. \$2.50.

Girls and boys will enjoy becoming acquainted with a deer through the eyes of Eddie and Jane who live at the edge of a woods. Hunger during a severe winter brings the animals almost to the children's doorstep, and with their parents' help they keep the deer from starving until "spring blows into the woods." Simple descriptive text and pleasing full-color illustrations give charm to this little nature story.

SEE THROUGH THE FOREST (6-10)

By Millicent Selsam, Harper and Brothers, New York, 1956. 8¾ x 6¾ in., 48 pp. Illustrated by Winifred Lubell. \$2.50.

From beneath the forest's leafy ground covering to the top of the tree branches, this book takes the young explorer. The "guide" talks simply but includes many an interesting fact about the different kinds of plants, birds, mammals, and insects that are to be found. This kind of book definitely inspires a child to stop, look, and listen—observing what he can, and wondering about things which may be near him though unseen. The pictures by Mrs. Lubell are imaginative and appealing.

THE MAGIC OF SOUND (8-10)

By Larry Kettelkamp, William Morrow and Co., New York, 1956. 8¼ x 6¼ in., 64 pp. Illustrated by the author. \$2.00.

Here is a book to catch the attention of the most disinterested youngster in regard to science, for who can ignore a fascinating explanation of how sound effects are made for the radio, or being told how to make a "string telephone." Besides such sure-fire interest-catchers, there is much solid information included, from an explanation of how sound is captured and used in telephone and telegraph to the uses of supersonic vibrations. Numerous drawings and diagrams are attractive as well as comprehensive. "The Magic of Sound" is highly recommended for the reluctant as well as eager students.

The Community of Living Things in FRESH AND SALT WATER (all ages)

By B. Bartram Cadbury, in cooperation with The National Audubon Society, Creative Educational Society, Mankato, Minnesota, 1956. One of five volumes. 11 x 8¼ in. 236 pp. \$6.95.

The sheer beauty of this volume, and of its four companion books, is enough to catch the interest of youngsters of all ages, making them increasingly aware of the subjects presented. Between the handsome covers are more than 100 full-page photographs, beautifully reproduced in sepia tint. The text establishes the importance of water, then takes up the plant and animal life of brooks, lakes, and other fresh-water bodies. The second half deals with life along the rocky coasts, sandy shores, and the salt sea. Besides a description of each creature and plant, Mr. Cadbury tells the role it plays in its community of living things, and points up the need for conservation. Other volumes in this series of nature books are "Field and Meadow," "City Parks and Home Gardens," "Forest and Woodland," and "The Desert."

MAJOR, THE STORY OF A BLACK BEAR (6-10)

By Robert M. McClung, William Morrow and Co., New York, 1956. 8½ x 6½ in., 64 pp. Illustrated by the author. \$2.00.

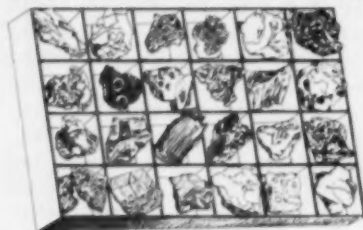
Families that are familiar with Mr. McClung's delightful books need only to know another has been published to wish to own a copy. Eight-year-olds, who three years ago enjoyed having his then newly-published story of a swallow-tail butterfly read to them, will now make a grab for "Major" anticipating reading it themselves. It graphically describes the growth of a bear from stumbling cub to full-grown adult, and is profusely illustrated with Mr. McClung's own striking drawings.

THE SEA AND ITS RIVERS (12 and up)

By Alida Malkus, Doubleday and Company, Garden City, New York, 1956. 8½ x 5¾ in., 221 pp. Illustrations by the author. \$2.75.

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THE PLUME HUNTERS MYSTERY (12 and up)

By May Nickerson Wallace, David McKay Company, New York, 1956. 8 1/4 x 5 1/2 in., 152 pp. Illustrated by Jean Porter. \$2.50.

What perfect material for a mystery-adventure is provided by the struggle between hunters of egrets and the people who were determined to save the great white birds from extinction! "The Plume Hunters Mystery" has all the excitement of the western thrillers—and young readers will be delighted to discover a different locale for a frontier type story. Here it is in the wild and unsettled Everglades of 1916. Though a law had been passed against egret hunting, "villains" were still able to market the plumes and would stop at nothing to obtain them. A teen-age boy whose father has been murdered, a family which befriends him, a school teacher whose best hat is decorated with egret plumes, and Alligator Charlie, a Seminole Indian, are among the cast of characters. Before two murders have been solved there is an abundance of suspense and intrigue, and frequent references to the Audubon Society's efforts to save the birds. At the conclusion, the young people have started to dream of a national park being established in the Everglades.

PATTY REED'S DOLL (8-12)

By Rachel Kelley Laurgaard, The Caxton Printers, Caldwell, Idaho, 1956. 8 1/2 x 5 3/4 in., 147 pp. Illustrated by Elizabeth Sykes Michaels. \$3.50.

Since Indians are part of this tremendously exciting story, in a sense it may be considered in the "natural history" category. Certainly it is of great historical interest, for it is an account of the Donner pioneering party which left Illinois for the "highly extolled" country of California, and which became snowbound in the Sierra Nevada Mountains. Their adventures are related through the medium of "Dolly"—a little wooden doll that was taken on the hazardous journey by eight-year-old Patty Reed.

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MY CONDITIONED CHICKADEES—Continued from Page 255

I crouched, and I covered myself over, to see what would happen. The chickadees were not deceived. They had always seen, or did see, enough of me to shatter my most painstaking efforts at hiding from them. Then I remembered how songbirds see and recognize hawks and owls, whether these predators are in flight or perching. I could only conclude that the chickadees recognized me in the very same way, no matter what I wore, or whether I was upright, or lying down. The picture the chickadees had of me was that of a whole figure, much simplified perhaps, if we could draw it exactly as they saw it, but nevertheless a highly adequate and appropriate picture. All the same, even the infallible chickadee can sometimes err, as I have seen them do, when the large gray form of a Canada jay reappears after an absence and suddenly throws its soundless short-necked shadow across the chickadee-heaven. And with the fright of the hawk deep in their hearts, the small birds sit perfectly still, in a "deep-freeze" pose, wherever they are, or they may scurry for cover.

I was never able to feel that the chickadees really knew me personally. Any man that came up our path to the house was to them a seed container, also. When I stood beside the stranger, the birds preferred to come to me, but only until my companion offered them a seed. After that, their preference for me quickly vanished. Many birds are able to distinguish one person from another, as we have learned from the fascinating accounts of Dr. Konrad Lorenz, and other specialists in the study of animal behavior. The difference between the environments in the learning of the wild birds of these experimenters and of mine may be this—that these people lived in heavily-populated communities where it was necessary for the birds to learn to distinguish one person who fed them from a multitude of indifferent ones. I live in the wilderness. There are not enough people here to make it rewarding for the chickadees to know us apart.

In the time that I knew Peet the First, I owned a blond muskrat coat with a dark collar. The first time I appeared among the chickadees

wearing this coat, the effect on them was spectacular. They flew away with every sign of distress. They refused to come near me. They went into a "mobbing" scene, as they often do at the sight of a dangerous predator, with loud scolding, wing-flicking, short flights from twig to twig, and chasing of each other which they did simply because they were too excited to contain themselves. Their noise and excited movements attracted every other bird in the vicinity, all of which fussed over the objectionable human creature that stood before them wearing fur.

What exactly these irate midgits took me for is difficult to say. I must have reminded them of whatever fur-bearing animal they were used to seeing—weasel, mink, or possibly muskrat. But obviously they were overdoing the thing. There is a peculiar tendency in birds to become overly-impressed by an object that in some way exercises an exaggerated stimulation on their senses. No doubt, in that coat I was a gross exaggeration of a predator to the chickadees. They never got used to it, and I was always unacceptable to them whenever I wore it.—THE END.

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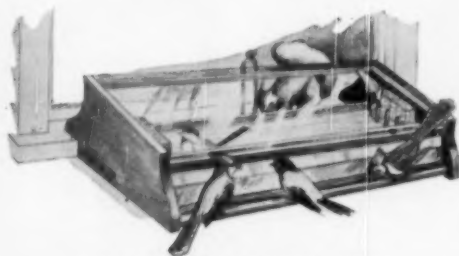
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